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THE PHENOMENOLOGY OF ACTS OF CHOICE

AN ANALYSIS OF VOLITIONAL CONSCIOUSNESS

BY
HONORIA M. WELLS

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HONORIA M. WELLS

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INTRODUCTION

THE research described in these pages was carried out in the Psychological Laboratory, University of London, King's College, during the sessions 1923–24, 1924–25.

I wish to acknowledge the advice and generous help of the Director of the Laboratory, Dr F. Aveling, under whose guidance the research was conducted, and who sat as subject for the experiments.

At the same time I wish cordially to thank the many assistants who helped in the investigation. I owe much to all those who ungrudgingly gave so considerable a time to the tedious task of acting as subjects; and, in particular, to R. J. Bartlett, M.Sc., R. C. McCarthy, M.A., G. L. F. Martin, and J. A. Taylor.

I am also indebted to many members of the staffs of other departments of the College; especially to the chemical department for providing the "tastes"; to the physiological department for the opportunity of assisting in an experimental investigation of the physiological causes of the "psychogalvanic reflex"; and to the department of physics for helping with several physical problems which arose during the course of the research.

The thesis was presented to the University of London for the degree of Doctor of Philosophy and part of the cost of publication of this research has been defrayed by a grant made by the University of London Publication Fund.

HONORIA M. WELLS

UNIVERSITY OF LONDON,
KING'S COLLEGE
March 1927

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CHAPTER I

THE OBJECT OF THE RESEARCH

THE main object of this research was to investigate some of the outstanding controversial questions concerning volitional activity debated at the present day among psychologists. The field is one of the most important, both from the point of view of the psychologist and the plain man, and it is one in which experimental evidence is most needed. Yet, compared with the exhaustive research and indubitable conclusions in other fields of psychology, it cannot be claimed that the experimental investigation of conation is in any stage but its infancy[1]. Psychologists, both experimental and theoretical, are by no means in accord even over the question of the nature of the psychical processes entering into an act of volition. Indeed some of the most vigorous of the will controversies have raged around this very point. Old problems are continually reappearing under slightly differing forms; and diametrically opposed experimental conclusions have been put forward in their solution. While there is confusion and contradiction over the phenomena of volitional consciousness, we can yet hardly hope for an establishment of laws and principles of conation.

We proposed, therefore, to plan an experimental research with the object of analysing as completely as possible all the processes occurring during an act of voluntary choice. Our aims may shortly be enumerated as follows:

(1) To investigate the phenomenology of the process of choosing by means of the introspective method of research.

(2) In particular, to determine the part played by affective states in the determination of an act of volition; and, if possible, to obtain evidence on the following point, "Is striving initiated by feeling, or is feeling a modality of striving?"

(3) To examine the nature of awareness of self-activity.

[1] We require a term in which we can refer to the activity exhibited in the dynamic relations which all living organisms seek to maintain with their environment. The word Horme has been suggested, notably by T. P. Nunn (*Education, its Data and First Principles*). Accepting Horme as a term expressing the conception of conative energy manifested in both mental and biological activities, we suggest that the original Horme of the human organism may find expression on one or all of the following levels: (1) as an instinctive activity, (2) as habitual activity, (3) as a determining tendency, (4) as voluntary activity.

(4) To accompany the introspective analysis by certain objective controls—reaction time, changes in electrical resistance, respiration and pulse—with a view to revealing a possible parallel between constantly reported factors in the introspection and specific changes occurring synchronously in the objective records.

From the time of the Greek philosophers down to the present day, the relation between conative and affective processes has always been the subject of debate. Although justifications for a tripartite division of conscious processes have been put forward from time to time, the predominant view has been that conative and affective processes are inseparably related. Aristotle, for example, analysed mental processes into cognitive and orectic, finding in the orectic faculty, both affective and conative components, functioning inseparably in the total process. And McDougall, in our own day, writes, "The conative element in emotional experience profoundly affects the experience. Subtract it, and the experience lacks its very essence, becomes empty, unreal, like the simulation of emotion. The impulse to action is an essential feature of emotion."[1]

Since Aristotle made his analysis there have been many theoretical developments of the question, but no experimental work has been attempted in demonstration of the presence and function of the affective component in an act of conation.

Our research was planned in the belief that if affective states entered as factors determining the course of development of the choice processes, their presence would certainly be revealed in the course of systematic and repeated introspection. As an objective corroboration of introspective report of coarser emotions and of genuine affective states, we employed instruments by which some of the physiological concomitants of the emotion would be recorded. These were the psycho-galvanometer, the pneumograph and the sphygmograph. By means of these instruments we hoped that the presence of emotional states might be demonstrated[2].

With regard to the third detailed point in the enquiry, awareness of self-activity appearing at the moment of decision, there has been considerable controversy. One of our aims in making a complete

[1] McDougall, *An Outline of Psychology*, Methuen, 1923.

[2] At the time of planning this research we accepted Whately Smith's conclusion, "There seems no *a priori* reason for doubting that the psycho-galvanic reflex will give a correct measure of the intensity of the emotion, or affective tone, elicited by a stimulus. The psycho-galvanic reflex... is by far the most delicate, reliable and quantitatively accurate method at present known for detecting and measuring emotional changes" (*The Measurement of Emotion*, pp. 25, 26). On the data now available from our investigation, we feel that this conclusion is unwarranted (see chapter IV).

analysis of the act of choice was to verify the presence of the phenomenon, "consciousness of action," reported by Michotte and Prüm[1], and denied by Wheeler[2]; to investigate the question as to whether it can, as Wheeler maintains, be analysed into sensorial and imaginal elements; and to see whether, by careful introspective analysis, any further features in the characterisation of the process can be revealed.

[1] A. Michotte and E. Prüm, *Étude Expérimentale sur le choix volontaire*, Louvain, 1910.
[2] R. H. Wheeler, *An Experimental Investigation of the Process of Choosing*, University of Oregon Publication, 1920.

CHAPTER II

METHODS AND APPARATUS

We may safely say that one reason for the backward state of will-psychology and for the diversity among will-theories arises from the extreme difficulty which attends the application of exact experimental methods to the observation of volitional phenomena. Wundt's statement still remains fundamentally true, "we can only hope to discover how an act of volition proceeds by following it exactly as it is presented in immediate experience." In the investigation of volitional processes, introspection is our chief instrument; and until the reliability of the method of introspection was emphasised by Külpe and his school, little systematic attempt was made to apply experimental methods to the investigation of will. We may now say that owing chiefly to the experimental researches carried out by the Würzburg and Louvain Schools, volitional phenomena have at last been submitted to the same precise and careful scientific investigation as has been applied to researches in the field of cognition[1]. In this research, following these Schools, we adopted the method of introspection as used by Ach, Michotte and Prüm, and Boyd Barrett in order to obtain a full account of all the processes observable in consciousness during simplified choices made under fixed conditions, by subjects who were trained in psychological methods. These introspective reports formed the most important data of the research, for although certain objective records were taken synchronously with the choice—notably the reaction times, psycho-galvanic and respiration records—we realise that these can never be of more than secondary and corroborative importance compared with the mental processes accessible to introspection.

General Method.

Our general method was to propose to our subjects specific choices between already evaluated alternatives, in a carefully planned order, presented under exactly similar conditions. Immediately the Choice Experiment was over the subject dictated a full report of all the processes which had been introspectible during the reaction period, i.e. from the moment when the two alternatives were presented to

[1] See "A Note on the Method of Introspection," p. 17.

the moment when he made his choice and reacted. The reaction time for choice was measured by a Hipp chronoscope. A photographic record of the subject's changes in electrical resistance was taken by placing his left hand in circuit with the psycho-galvanic apparatus. In the earlier experiments changes in respiration were recorded on a kymograph; and in some experiments we attempted to obtain a pulse tracing on the same kymograph by means of a sphygmograph strapped to the subject's left wrist.

The subject was seated in a quiet room, while the chief experimenter exhibited the stimulus, took the photographic records of changes in resistance and read the reaction times in another room. When respiration and pulse records were taken an assistant remained in the subject's room to operate the kymograph motor. Otherwise the subject was alone during the reaction. As far as practicable the subjects were kept ignorant of the detailed points of enquiry in the research, so that they could more easily give an impartial account of their mental processes during the choice. Also there was no communication between the different subjects regarding the experiments.

The Material.

The material providing the alternatives in the choices consisted of liquid tastes of very varying hedonic quality; some were very pleasant, some indifferent, and others very unpleasant. The liquids were practically odourless, quite colourless, and the prescriptions were carefully dispensed so that the qualitative nature of the taste was kept constant. Eight "nonsense" names, unlikely to have associations for any of our subjects were chosen for these tastes. The complete list was as follows, the composition being that prescribed by Michotte, University of Louvain, for Boyd Barrett's experiments on Choice[1]:

Klum	Sulphuric acid	1 grm. in 1000 c.c. water
Vab	Sodium carbonate	10 grm. „ „
Jor	Ethyl alcohol	50 grm. „ „
Laip	Saccharose	50 grm. „ „
Zul	Sodium salicylate	50 grm. „ „
Mep	Sodium chloride	50 grm. „ „
Ziv	Essence of anis	3·5 c.g.
	Alcohol	20 c.c.
	Syrup	304 c.c.
	Water	676 c.c.
	A trace of saponin	

[1] Boyd Barrett, *Motive-force and Motivation Tracks*. Longmans, Green, and Co. 1911.

Tauk

Essence of bitter orange ...	6 c.g.
Alcohol	20 c.c.
Syrup	175 c.c.
Water	819 c.c.
A trace of saponin	

There were three stages in the procedure of the research: (1) the Learning of the Tastes, (2) the Recognition Experiments, (3) the Choice Experiments.

While perfecting the technique, a preliminary series of 50 Choice Experiments was made with subject A. These were essentially similar to those in the main research, the only difference being that instead of using the names to be used in the Choice Experiments proper, combinations of the letters A, B, C and D indicating the tastes "bitter," "sweet," "acid," "salt," were shown. Very interesting results were obtained from these experiments, but the data have not been incorporated in the conclusions from the research.

The Learning.

In the Choice Experiments proper, it was impossible to present the two alternatives *as tastes* directly to the subject, but this difficulty was overcome by presenting the "nonsense" names of the taste. The aim of the preliminary experiments was to establish a strong association between the taste of the liquid and its name. The following procedure was adopted. Glasses containing a few c.c. of each liquid were arranged in a definite order known to the experimenter, and a card bearing the name was placed in front of each glass. The subject was required to take a sip from each glass successively, and at the same time to repeat its name. Each liquid was tasted four times daily. On the following day the experimenter changed the order of the glasses, and the subject tasted as before. This change of order prevented associations between contiguous tastes and between a taste and any given place in the order of tasting. As far as possible the daily repetitions were kept continuous. They lasted for about 20 days, each liquid being tasted about 80 times. The exact number of repetitions was as follows:

Subject	A.	84
,,	B.	84
,,	C.	76
,,	D.	72
,,	E.	88
	F.	72

The Recognition Experiments.

After the 12th day of the "tasting" experiments, the Recognition Experiments were commenced. The aim of these was to measure the reaction time for the associations formed. It is obvious that the time for reproduction of meaning of a "nonsense" name influences the reaction time for the Choice. Any imperfectly learned name has the effect of lengthening the time of any reaction into which it enters, thus seriously weakening any argument based on length of reaction time. The Recognition Experiments aimed at freeing the results from this influence by making the reproduction time as constant as possible. In this way it could be eliminated as a significant factor contributing to temporal differences in the reaction times for choice.

We adopted the following procedure: The "nonsense" name was exhibited in the card-presenting apparatus to be used later for exhibiting the names of the alternatives in the Choice Experiments. The subject was instructed, "react when you know what this is," and it was explained that any sort of revival of meaning could be accepted, and that he need not wait for the revival of a specific gustatory image. The chronoscope was placed in the circuit. The fall of the shutter exposing the name made the contact starting the clockwork which continued to run until the subject reacted. When the reaction times became more or less regular, indicating approximately equal association strengths, the experiments were stopped. The average association times for the different subjects were as follows:

A.	...	...	344 sigma
B.	...	...	561 „
C.	...	...	789 „
D.	...	...	484 „
E.	...	...	652 „
F.	...	...	537 „

At the end of this stage each subject was asked to write down the eight tastes from memory in order of hedonic value as he had estimated it during the "Tasting" Experiments[1]. After this preparation the subjects were ready for the Choice Experiments forming the bulk of the research.

[1] See p. 66, Table IX, column 1.

The Choice Experiments.

The eight tastes presented two by two permitted of 56 possible combinations, taking into account both space orders—left, right and right, left. The names of these combinations were printed on cards which were divided into eight sets of seven choices each. Seven choices occupied from 40 to 45 minutes and most subjects found it impossible to maintain their freshness for a longer period than this; therefore, no subject was asked to make more than one sitting a day. Thus the series was complete in eight days, after which it was recommenced in a different order.

Except for week-ends, and in subjects A. and C. the Easter and Summer vacations respectively, the daily experiments were continued without a break. All the experiments were carried out personally by the writer, except the 85 in which she served as a subject.

The card-presenting apparatus stood on a table at a convenient distance from the subject, who was seated before it with his finger on the reaction key *R*. When the key *S* was closed the shutter was held up by the electro-magnet *A*. When, at a given moment the experimenter broke contact *S*, the shutter fell exposing the stimulus. In this position the metal plates *B* and *C* closed the Hipp chronoscope circuit. The clock hands then registered the time elapsing until the subject took his finger off key *R*, having made his choice. Thus the reaction time for choice was recorded for each experiment. A time-marker *D* was inserted into this circuit so that the reaction time, besides being registered on the Hipp, was recorded graphically on a kymograph. This enabled us to relate changes in the physiological state of the subject to the reaction period. A respiration curve was registered on this kymograph by means of a pneumograph. Pulse records were also attempted by strapping the sphygmograph to the left wrist, but the arrangement of so much apparatus at one time was found to be too clumsy for the subject and tended to interfere with his adaptation for the choice. The taking of pulse records was therefore omitted. Records of the subject's changes in electrical resistance were also recorded, and the electrodes *E* of the psychogalvanic apparatus were placed on the palm and back of the subject's left hand. The arm was kept quite firm in a rest, and uniform pressure of the electrodes was maintained by means of a rubber pad beneath the palm.

When this apparatus was adjusted the experimenter placed two glasses on the table, just beneath the shutter where the two corre-

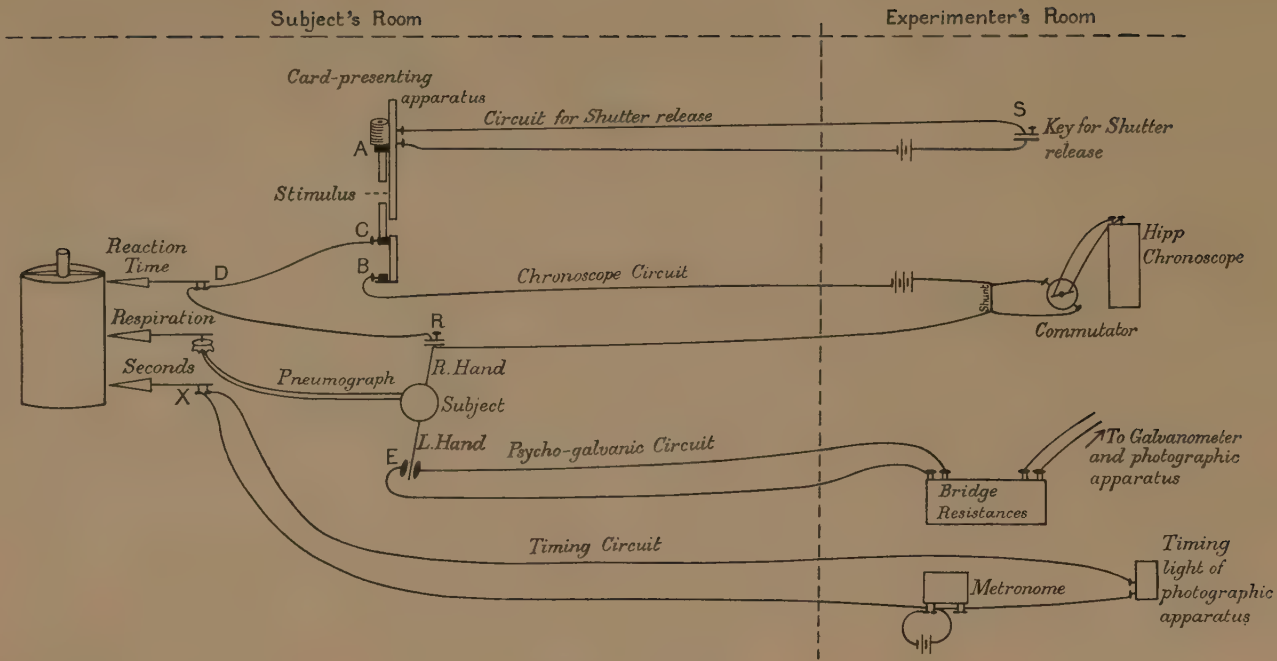


Diagram 1. Apparatus.

sponding names would shortly appear. She then gave the following instruction: "You are to choose, for a serious motive, between these two tastes, and drink the one you have chosen. React as quickly as possible." The experimenter then returned to the other room, noted the subject's resistance, started the motor driving the photographic paper, gave a warning to the assistant to set the kymograph moving in the subject's room, and started the chronoscope. After a short interval a warning was given to the subject, and, two seconds later, the key *S* was opened, dropping the shutter of the card-presenting apparatus and showing the names of the tastes. On seeing the names the subject deliberated, made his decision, and put out his right hand to take up the chosen glass. In making this movement the key *R* was released, breaking the chronoscope circuit.

The subject then dictated as careful and complete a report as possible of all the processes he had observed in consciousness during the reaction. The date, time of day, and details of any unusual mental or physiological state in the subject were recorded on these introspections; the records of respiration and change in resistance were also inserted. Thus each page contained the complete data available for a future analysis of the Choices.

One important modification of the technique of the choice experiments was introduced about half way through the Choices of the first subject to be experimented upon. With repetition of similar choices a tendency of habitual choosing developed, and this was a disadvantage from the point of view of introspecting volitional phenomena. To counteract this tendency, new names representing unevaluated alternatives were suddenly introduced into the experiments. These new tastes were compounded on the same principle as those already in use; a full list is given in the appendix[1]. When a "new" taste was presented with one of the old ones we could trace the development of the motive of curiosity; when, with repetition, the "new" tastes became partially known, we could observe the conflict and the decision when opinion and belief were opposed to certainty.

Except for the introduction of one of these "new" names on the stimulus card, and the substitution of the corresponding glass, the procedure was the same as that described earlier.

[1] p. 156.

The Psycho-galvanic Apparatus.

The apparatus used for measuring the galvanometric deflections occurring as the subject's resistance changed, was made by Gambrell Bros., Ltd., after the pattern of the late Dr Waller. The subject's body was placed as a resistance in the fourth arm of a Wheatstone bridge. Contact was made by two zinc electrodes $\frac{3}{4}$ inch in diameter,

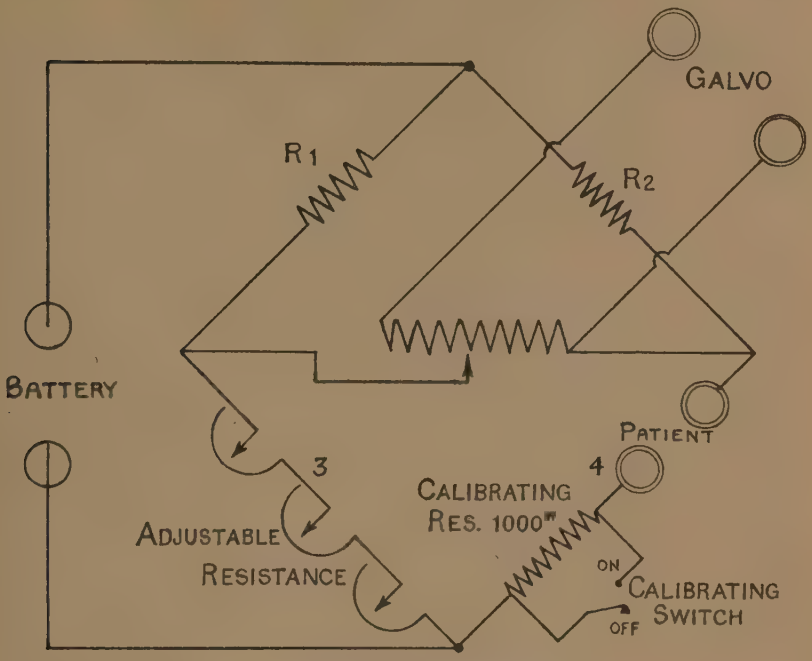


Diagram 2. Bridge Resistances.

covered with washleather which was soaked in 9 per cent. salt solution before the set of experiments commenced. These were attached in the manner just described, to the palm and back of the subject's left hand. The accompanying figure (Diagram 2) shows the arrangement of the resistances in the bridge. They have been represented diagrammatically for the purpose of clearness. Actually all the resistances except that supplied by the patient were fixed in an insulated box so that the only contact possible was through the electrodes. Arms (1) and (2) contained fixed resistances in

the ratio of 1 to 10 (1000 ω to 10,000 ω). Arm (4) was provided by the patient's body. Arm (3) contained an adjustable resistance by means of which the whole bridge could be balanced as soon as the subject was placed into the circuit. There were 22 possible points of contact in this variable arm of the bridge: ten points graded in 1000 ω increase; ten in 10,000 ω increase; and two in 100,000 ω increase. Contact with these points in the resistance could be made rapidly by means of a moving dial on the surface of the box, until an accurate balance of the subject's resistance was obtained.

A weak current was passed through the bridge from two dry cells, of low internal resistance, giving together about 4 volts. These were replaced as soon as the total voltage fell below 3·5. The galvanometer was connected to the balance points of the bridge, and the amount of current flowing through the coil when the potential of the balance points changed was regulated by a universal shunt, graded so that fractions of the total current varying from $\frac{1}{500}$ to 1 could be passed through the galvanometer[1]. Therefore the observed deflection had to be increased in proportion to the shunt used. Actually the dial giving these different points of contact was numbered to read the reciprocals of these fractions, thus giving directly the number by which the observed deflection had to be multiplied to give the true deflection. The galvanometer was of the moving coil type (Onwood's patent). The resistance of the coil was 100 ω and the sensitivity of the instrument 330 mm. per microampere at 1 metre scale distance. The period of the deflection was four to five seconds and the movement of the coil was well damped.

In our preliminary experiments the amount of deflection was read directly by observing the movement of the light-spot over a millimetre scale placed one metre away. When the subject had been placed in the bridge, his resistance and the shunt of the galvanometer were noted by the experimenter just before the stimulus was given. The alternatives were then exhibited and the experimenter counted the number of centimetres deflection occurring during the process of choice.

The calibration of the galvanometer.

The absolute values of the deflections in centimetres do not, however, admit of comparison one with another on account of the varying

[1] In practice the amount of current passing through the galvanometer was kept as near to unity as was consistent with keeping the spot of light on the scale. Thus the multiplication of a slight error attending the observation of very small deflections was avoided.

initial resistances. We have found the resistances of different subjects, and of the same subject on different days and at different times of the day, to vary at anything from 7000 ω to 70,000 ω. Moreover, it is very unusual for the subject to maintain his original resistance throughout the sitting—usually lasting about 45 minutes. Therefore a change of resistance producing a deflection of x cm., indicating an absolute disturbance of the balance by a reduction of y ohms, must obviously bear a different relation to an original resistance of, for example, 10,000 ω to one of 50,000 ω. It was necessary for us to know exactly what percentage drop in the original resistance the different deflections indicated. To provide this data the following method was employed.

A post office box replaced the subject in the fourth arm of the bridge. Its resistance was first placed at 10,000 ω and the bridge was balanced by the variable resistance in the usual way. 100 ω were then removed from the box causing a deflection of a certain number of centimetres, carefully observed on three successive occasions. This reading therefore indicated a fall of 1 per cent. on a resistance of 10,000 ω. Similar readings in centimetres were obtained for reductions of 2, 3, 4, 5, 6, 7, 8, 9, and 10 per cent. on the original resistance. Thus a curve could be plotted expressing the relation between the size of the deflection and the percentage fall in resistance on 10,000 ω. Similar curves were plotted for percentage reductions on resistances of 20,000, 30,000, 40,000, 50,000, 60,000, 70,000, 80,000, and 90,000 ohms. Thus, by knowing the subject's initial resistance, the percentage fall for any number of centimetres deflection could be read off directly from these curves.

The Photographic Records.

The method of reading off the number of centimetres deflection directly from the scale was only employed in the preliminary experiments. During the other experiments of the research photographic records of the deflections were obtained. The galvanometer and light were placed inside a box (Diagram 3), and by means of a lens placed in front of the galvanometer mirror the ray was brought to a focus on a screen at the other end of the box about 50 cm. away. This screen was provided with a very narrow horizontal slit, and behind this a sensitive ribbon of bromide paper was passed at an even rate, the spindle which wound off the paper being revolved

by a small clockwork motor. In this way a photographic record of the movements of the light was obtained. A time-marking was

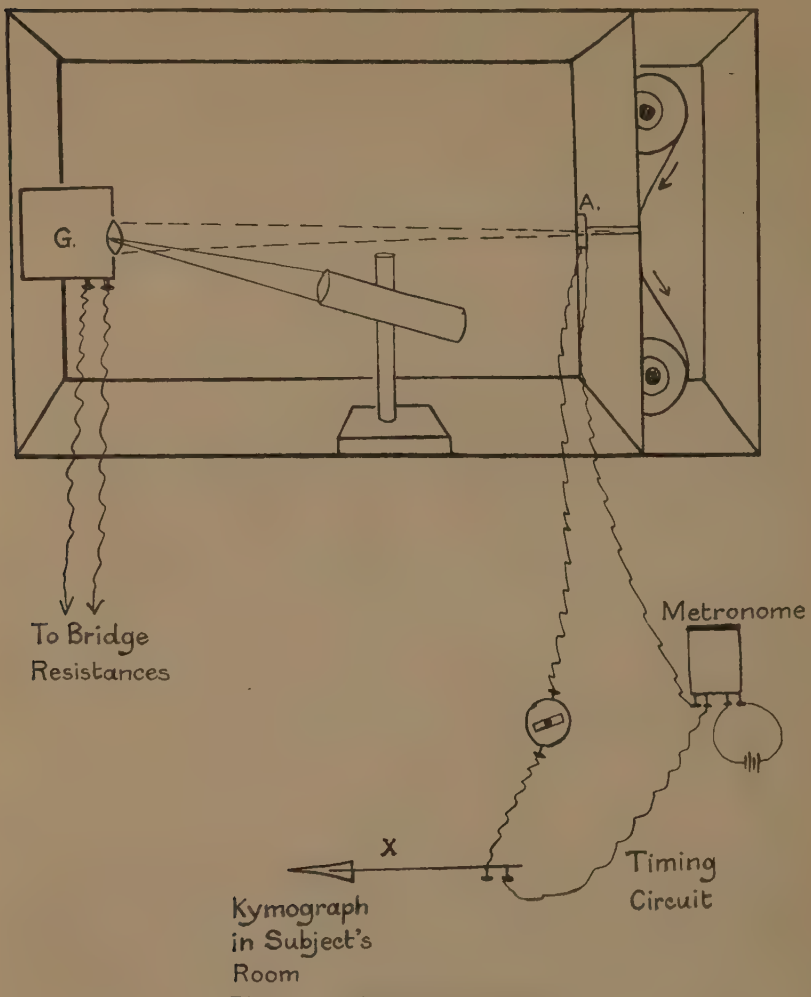


Diagram 3. Photographic Apparatus.

registered along one edge of the bromide paper by means of a small light in the box *A*. The current supplying this light was made momentarily every second by means of an electric pendulum. Thus a light shone through the slit in the box once every second, making

a mark on the bromide paper. When respiration records were being taken at the same time, a synchronous time marking was obtained by introducing into this circuit the marker *X*. This gave a time-tracing on the kymograph record of respiration similar to that appearing on the photographic record of changes in resistance. By

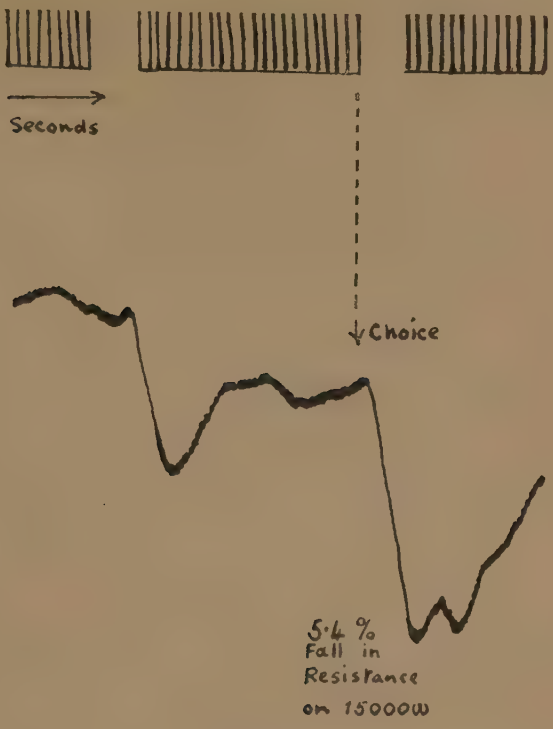


Diagram 4.

means of a switch introduced into the timing-circuit the operator could shut off the light altogether for any period. She did so for about four seconds when the "warning"[1] signals were given, and when the stimulus words were shown. By means of these gaps in the time-tracing, changes in resistance at the signals and during the reaction could be identified. At the end of the seven experiments forming one day's set, the bromide paper was developed and fixed. The records

[1] See pp. 25–28, 37.

were carefully dated, numbered, named, and each one was placed with the corresponding introspection.

The amount of deflection occurring at the choice could be measured on the photograph by means of dividers. This, multiplied by the shunt of the galvanometer gave us the total deflection in centimetres[1]. Thus, knowing the initial resistance, the percentage fall indicated by these deflections could be read off from the calibration curves. For example, in the accompanying photograph (Diagram 4) the initial resistance was 15,000 ω and the shunt 10. The measured deflection occurring at the choice was 3·5 cm. This, multiplied by the shunt, gives 35 cm. But this was the deflection obtained at a distance of 43·3 cm. instead of 1 metre. Therefore the true deflection is $(35 \times \frac{100}{43 \cdot 3})$ 80·8 cm. This represents a fall in resistance of 5·4 per cent.

Measurements similar to these were made for every deflection appearing at the warnings or the choice, involving altogether about 2700 measurements and calculations. The percentage falls in resistance were entered on each record, so that later, when the amount of fall in resistance for a specific type of choice or a given "warning" signal was required, the necessary data were easily accessible. The time-tracing on the photographs enabled us to read the length of the latent period, the rate of the fall in resistance, the number of seconds after the reaction at which the resistance began to recover, and the time at which any second deflection occurred[2].

The Respiration Records.

We employed the usual physiological method of registering respiration by means of a pneumograph. The original feature of our

[1] The galvanometer was calibrated at 1 metre scale distance. As the photographic paper was 43·3 cm. from the galvanometer mirror, the deflections given on the photograph had to be converted by means of a ratio to what they would have been had the paper been exactly at 1 metre distance.

[2] A second deflection, occurring from 4 to 12 seconds after the first, was very common in our records. This gave the deflection occurring at the choice a characteristic double peak (see accompanying photograph). We cannot advance any completely satisfactory explanation of this phenomenon. Although for the purpose of this research we have taken account only of the amount of fall in resistance as an indication of the degree of conation (see chapter III) involved in the choice, we are of opinion that further and even necessary work in the more minute analysis of each deflection as a whole is required. We refer specially in this connexion to such characters of the curves as the slope of the fall, superimposed partial recoveries, period of deflection and the like. We spent many months in attempting to investigate several of these characters but, finding no criterion of interpretation, adopted the method indicated.

Dr Godefroy, Amsterdam, in the *Psycho-electro-tacho-gram and Exophthalmic-Goitre*, also makes reference to these characters.

technique was the method by which we synchronised the psycho-galvanic and the respiration curves by means of a common timing-circuit.

As we stated in the discussion of our problem, we employed these instruments in the belief that we should be measuring some of the physiological concomitants of states of emotion occurring during the reaction period. We must now turn to the interpretation of the records we obtained.

A Note on the Method of Introspection.

The only objection which has been raised against the methods and conclusions of the Würzburg and Louvain Schools was put forward by R. H. Wheeler. Wheeler claims to have analysed the "Bewusstheit" of Ach and the "Conscience de l'action" of Michotte and Prüm (together with other similar states) into sensations and images. He admits their occurrence for he writes—"Analysed *v.* Unanalysed Experience," *Psychological Review*, 1922, p. 436: "I have adhered to Ach's and Michotte's definitions of Bewusstsein...and have verified the existence of such processes"; but it is not very clear whether Wheeler regards these states as different from, or identical with, the sensations and images into which he attempts to "analyse" them. He characterises them as secondary elaborations of basal contents (*ibid.* p. 440) as exclusively constituted of sensation and image (p. 446), as functional rather than structural (p. 439). Neither is it clear that Wheeler's "analysed account of experiences" are introspections pure and simple or reconstructions from many introspections. We read the article in the former sense, but if this is correct we feel that a prodigious power of memory is demanded of the subject making the introspection.

We cannot, however, agree with him. If there is anything "basal" in consciousness, certainly "action" is; and further, it is analysable; that is to say, it is refractory to the attempt to break it up into simpler elements. To say that action-states are "interpretations" of sensations and images is not to analyse them, but rather to affirm a "faculty" of interpretation which makes it possible for them to occur so that Wheeler can "verify the existence of such processes." To say that they *are* sensations and images is to change their nature altogether. What real evidence is there, save Wheeler's statement, to identify imageless awareness or action with sensations and images,

or to make them interpretations of these? There is none in the case of the first alternative; and the second is no more than a postulate, the necessity of which is not obvious.

Despite Wheeler's assertions, psychologists of the calibre of Ach and Michotte—to mention only those with whose investigations he deals—are not likely to have gone astray in the matter of introspection. In the present research we have paid special attention to this point, and confidently corroborate the findings of Ach and Michotte on this question.

CHAPTER III

INTERPRETATION OF THE OBJECTIVE RECORDS

In the chapter on method we stated that we took photographic records of the subject's changes in resistance, together with respiration and pulse curves, covering the whole period of the experiment, from the moment he was ready, to the time he dictated his introspective report. These three records of physiological changes were chosen as being particularly suitable for indicating emotional changes during the process of choice.

We accept the view that emotion, so called, is a complex state including the results in consciousness of bodily commotion. When the somatic resonance following upon the cognition of a specific stimulus has passed from the region of lived experience into awareness, we have an emotion of a particular kind.

It has been claimed that an act of volition involves, among other factors, a reference to, and a consideration of values considered as a relation of the *affective* aspects of the alternatives to the self. It will be remembered that one of the problems of our analysis of the act of choice was to discover the part played by these affective factors; to trace their influence on motivation and on the direction of conative activity. We based our method on the belief that emotional states developing during the reaction period would be reported in the introspections, and that the somatic resonance accompanying the awareness of such states would be registered by characteristic changes in the records of variations in electrical resistance, respiration and pulse. In this way we felt that valuable objective controls of the introspective reports might be obtained.

According to the generally accepted theory, the psycho-galvanic reflex, caused by a fall in the resistance of the subject's body to a weak electric current, is indicative of changes in consciousness of an emotional character. This appears to be the view adopted since its original formulation by Féré, and it is the view held to-day by Prideaux, Golla, Whateley Smith and other investigators who have concerned themselves with the psychological significance of the psycho-galvanic reflex. In planning this research we also at first adopted this view and employed the reflex as a possible means of demonstrating the presence of emotional states.

On examining the photographic records of the subject's psycho-galvanic reflex, it was noted, allowance being made for the latent period[1], that a fall in resistance occurred with great regularity at the time of choice, in the case of every subject (7) tested (see Fig. 1).

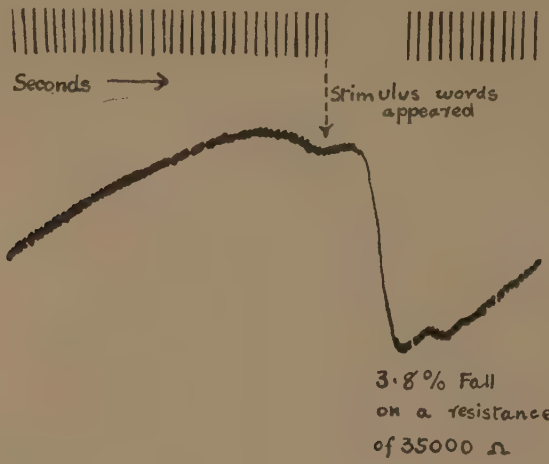


Fig. 1.

The arrow indicates the direction in which the photographic paper was moving. The upper tracing gives the time record in seconds, and the arrow indicates the time at which the stimulus words were shown. The lower tracing indicates changes in the subject's resistance. The deflection in this figure has been measured according to the method described in chapter II, and indicates a fall in resistance of 3·8 per cent.

The actual deflection measured on the psycho-galvanic record was, in each case, expressed as a percentage fall on the original resistance (see chapter II, "Method"), and the average percentage fall in resistance at the period of choice was worked out for five of the subjects (see Table I).

[1] The deflection indicating a fall in resistance does not appear immediately the stimulus is given. The "latent period" between the giving of the stimulus and the appearance of the deflection has been commented on by all investigators of psycho-galvanic phenomena. In our researches we found it to vary considerably from subject to subject (the range being from 1·5 sec. to 5 sec.), but to remain approximately constant for any given subject. We have not worked up the data at our disposal regarding conditions affecting the latent period, but we have found the general average to be about 2 sec.). On looking at the time-records in the photographs given in this chapter, the latent period will be clearly seen.

We then examined the protocols with a view to discovering reports of specific factors to which these apparently significant deflections, occurring synchronously with the choice, might possibly be related. This examination brought to light the fact that very few processes of a truly emotional character were reported in the period of choice. Pleasure and unpleasure were sometimes reported, but the wording of the reports most commonly relates them to the moment of designation—pleasure if the act of conation has run its course smoothly, unpleasure if the act is complicated by necessity for striving against personal inclination, as for example when a subject forces himself to take an unpleasant alternative.

Table I.

Subject	Average percentage fall in resistance at the choice
A.	2·75
B.	4·03
C.	6·38
D.	1·25
E.	6·34

A. 1. "Distinct pleasure that the thing was going well. The whole went quite quietly and I am not conscious of any physiological feeling except on the finger tips on the key and in eye muscles."

A. 6. "Pause, during which the meaning of *Mep* was chiefly before consciousness. It became clearer. Strong feeling of effort, and strong muscular sensations in jaws and neck. Then, auditorily and kinaesthetically, 'I will choose *Mep*.' I reacted and drank *Mep*. Was then conscious of great unpleasure and changes in breathing."

A. 7. "Mental turning away from *Zul* and a feeling of being drawn to *Ziv*. Momentary hesitation; then with a feeling of triumph, *Ziv* was accepted quite calmly with consciousness of action, and a mental state equivalent to, 'Oh well, I know perfectly well that I'm choosing *Ziv* because I like it, but after all why not? That is a good enough motive for the experiment.' Pleasure distinct."

A. 8. "I think, auditorily and kinaesthetically, 'Oh well,' nothing else. But this had reference to *Vab* and forcing myself (to take it). An intention towards *Vab*. I reacted and drank *Vab*. The whole was marked by unpleasure and a sort of feeling of opposition and dislike."

A. 10. "A trace of displeasure when I got the meaning of *Mep*. Distinct feeling of relief and pleasure at the designation of *Jor*."

A. 12. "Knowledge of the nastiness of *Mep*. *Mep* strongly in consciousness. That attracted me. I felt I had very nearly decided on *Mep*. Meaning of *Klum* not so present in consciousness. However, with distinct consciousness of action I designated *Klum* knowing I was reacting on hedonic lines. With a feeling of relief and pleasure I reacted and drank *Klum*."

A. 41. "Then *Jor-Ziv* again with a clear knowledge of their relative value. The meaning of *Ziv* developed rather prominently. The word 'Yes' auditorily and kinaesthetically, as if accompanied by inverted commas. I reacted and drank *Ziv* with a certain amount of pleasantly toned content. I cannot discriminate the pleasure as something separate from it."

A. 42. "Meanings had now become discriminated, and the relative value quite clear. Knowledge that the reaction was taking time. Then very faintly and very indistinctly, auditorily and kinaesthetically, the words, 'Oh well, I'll.....' But the meaning was, 'I will choose *Zul* because it is the least unpleasant.' I accepted *Zul* and reacted with a certain amount of unpleasure."

A. 58. "...Knowledge that both were horrible. Very strong negative motivation. Distinct feeling of unpleasure at the opposition and helplessness."

C. 27. "Seemed to be a mental reading of the stimuli in two parts. No sequence: with the meaning of *Klum* as being near the neutral region. Was aware *Mep* was distinctly unpleasant. Mind immediately swung back to *Klum* which I took. Displeasure on drinking and finding *Klum* sharp to the taste."

E. 7. "Saw stimuli. Remembered having talked previously of preference order. To-day, felt I preferred *Klum* to *Zul*. Something seemed to say, 'Stop, and think which is best; choose for a good reason.' This was a feeling; no words present. Looked from one to the other. No reason came. Found I was saying rapidly, 'I must hurry up and choose.' Tension and annoyance seemed to be increasing. Seemed to reach a breaking-point. Eye happened to fall on *Klum*. Found I was taking *Klum*. Feeling of relief and satisfaction followed immediately I had started to move my hand."

F. 40. "Shutter opened. Words were not there (they were lower on card than usual). Slight annoyance. Then eye movements (to find words)."

D. 41. "Reacted and drank *Ziv* with a certain amount of pleasantly toned content. I cannot discriminate the pleasure as something separate from this."

Affective states were scarcely ever reported during the process of motivation and deliberation. There were contents of the nature of knowledge of the pleasantness or unpleasantness of the alternative; judgments that one was more pleasant; thoughts about pleasantness. But it was a very infrequent occurrence for any actual affective state to be reported during the reaction period.

Accordingly, as the reflex appeared so constantly at the act of choice (see Table I, page 21), we sought again among the introspections for process other than affective, to which the deflections might possibly be related.

Choices were first differentiated according to their nature, the criterion in this selection being the subject's introspective report of his conscious experience during the choice. Cases of "difficult" or

"hard" choice were grouped together. These included a large proportion of cases of bad adaptation and of negative motivation—the alternatives often being judged as equally good, bad or indifferent to the subject. In these cases the subjects report that they had to make a more than ordinary effort to bring about the choice at all; i.e. to strengthen one of the motives to the "critical point."[1] We found, with every subject examined, that the fall in resistance was proportionately greater in these cases of difficult choice (see Table II).

Table II. Comparison of average percentage fall in resistance in "difficult" choices, with average percentage fall for all choices.

Subject	Average percentage fall for all choices	Average percentage fall for "difficult" choices	Variation of Av. I from Av. II (%)
A.	2·75	3·77	+37·1
B.	4·03	6·52	+61·2
C.	6·38	11·70	+83·3
D.	1·25	1·80	+44·0
E.	6·34	8·88	+39·9

All the subjects at some point in the course of the experiments experienced a marked change in the character of consciousness at the moment of choice. They made great efforts to describe this; but it proved very elusive and difficult to characterise. The following are some of their attempts:

"A sort of swing of the mind"; "A mental direction to *Klum*"; "An intentional turning to *Ziv*, faintly tinged with action. There were also muscular feelings throughout from eyes and forehead"; "Choosing *Mep* seemed like aiming a dart to hit it"; "I seemed to jump upon the alternative"; "As if I were being thrown into the arc of a circle, but I'm sure my eyes did not move"; "Sort of mental movement to *Tauk*"; "Swing of attention with feeling of activity"; "*Mep* chosen after a blank; nothing present in consciousness but a lot going on"; "Feeling of mental strain; great activity, but it seemed pent up."

Two of the subjects, familiar with previous work on volition, after a few attempts to find expressions of their own for this phenomenon, definitely identified it with the "consciousness of action" reported by Michotte; and all the subjects agree in describing it as a dynamic state accompanying direction of attention.

The point to be emphasised in this connexion is that all the expressions chosen by the subjects to describe the phenomenon in question are essentially conative in character. This gave us a clue to the view, for which evidence is put forward in the present chapter,

[1] See p. 83.

that the psycho-galvanic reflex appears as an indication psychologically of a conative rather than an emotional state. With a view to throwing more light upon the apparent parallel between the psycho-galvanic reflex and conative effort in the act of choice, an attempt was made to discover the presence or absence of a quantitative relationship between them. Three of the subjects, unsolicited, discriminated such quantitative aspect in their experience of "activity," and reported various degrees of consciousness of action, as strong, distinct, moderate, weak, faint, tinge. Others, on being pressed, were able to make some estimate of it. The average percentage drop in resistance in choices reported as "automatic," "habitual" or "easy" was compared with that of choices in which strong consciousness of action was mentioned. Classification on this basis gives us the following results:

Table III. Comparison of average percentage fall in resistance for different types of choice, for all subjects.

	I.	II.		III.	
Subject	Average percentage fall for all choices	Average percentage fall for "habitual" choices	Variation of Av. II from Av. I (%)	Average percentage fall for choices where strong "activity" was reported	Variation of Av. III from Av. I (%)
A.	2·75	1·76	−35·5	3·3	+26·6
B.	4·03	2·15	−53·0	6·4	+58·0
C.	6·38	2·48	−61·0	8·85	+37·1
D.	1·25	·24	−80·8	1·8	+44·0
E.	6·34	3·9	−38·4	8·45	+33·1

We shall fully discuss the question of the appearance of this phenomenon, consciousness of action, in chapter VI. It is sufficient to say here that normally we fail to isolate it as an item of cognised experience; but, where the choice becomes impeded or difficult, consciousness of action generally becomes an observable phenomenon. As was mentioned previously, most subjects came to discriminate a quantitative aspect in it and attempt to report the degree of intensity of activity. We may then regard the condition for its appearance in consciousness as the intensification of a conative state.

From this part of the investigation we can formulate the following general conclusions. Numerical results give us evidence for the belief that there may be some relation between conative states and the appearance of the reflex. Where a greater drop in resistance occurs, we have the introspective evidence of an intensification of the cona-

tive state. As emotional processes reported were few or none, we may formulate the hypothesis that *the occurrence of the reflex, whatever it may signify with regard to physiological change, is regularly preceded by changes in consciousness of a conative, rather than an emotional, character.*

On examining some 850 photographs of the reflex, it was seen that, besides the deflections at the choice period, two other characteristic

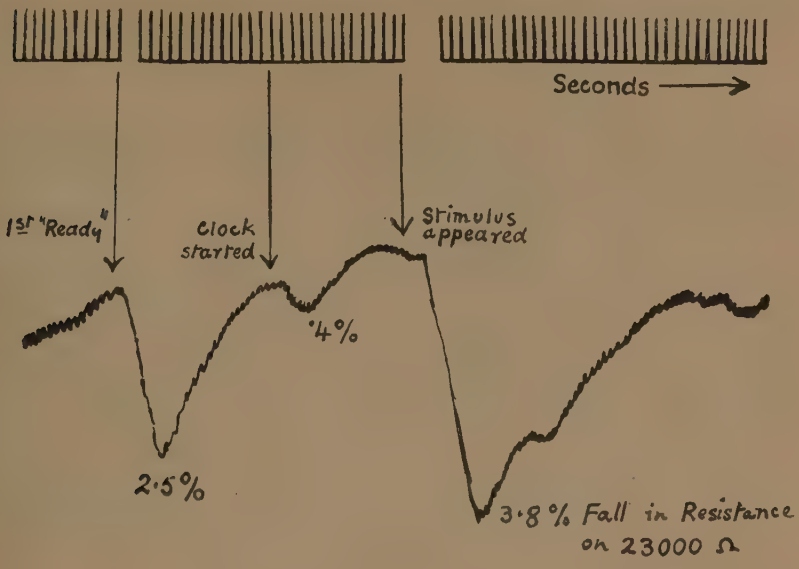


Fig. 2.

deflections invariably occurred at given points in the record. During the experimentation it was necessary to give, from the experimenter's room, a signal to the assistant operating the kymograph, as well as one to warn the subject of the approaching stimulus. Between these, the Hipp chronoscope was started; and its high, singing note was heard by the subject. It was noticed that two deflections occurred, besides that of the choice. Allowing for the variable latent periods of the reflex, these falls in resistance were found to synchronise with the time of the signal and the clock.

The average percentage fall in resistance for the warning signal

and the sound of the Hipp was calculated for four subjects. The results are given in Table IV.

Table IV. Average percentage fall in resistance at the signals.

	I	II	III
Subject	Percentage fall at first signal	Percentage fall at sound of clock	Percentage fall at choice
A.	1·07	·63	2·75
B.	2·5	·9	4·03
C.	3·2	1·8	6·38
F.	3·7	3·0	6·34

NOTE. All cases of the reflex at the signals have been included in columns I and II. They include a large number of cases where the deflection was very small or failed to appear; and where in the introspection the subject reports not having heard or attended to the signal. These tend to lower the average considerably.

Accordingly, an attempt was made to analyse the mental processes occurring at these points with a view to finding corroboration of the hypothesis previously stated. Sometimes these were forgotten by the time the subject dictated his introspection on the period of the choice; but they were, on the whole, remembered with astonishing completeness. Several processes were discriminated which seemed of interest.

The usual phenomena of expectant attention occurred—muscular sensations in chest, neck, jaws and eyes; strong tactual-pressure sensations of the tongue against the lower teeth; a vaguely undifferentiated sensation designated as strain. But, as a rule, consciousness was so contracted at these points that little was in focus other than the vague strain.

Thoughts, or mental directions towards what would appear, were not infrequent. No affective processes were reported.

What was most salient was a process which could not be satisfactorily named by the subjects. The first to be investigated spoke of "excitement" and "pulses of consciousness." "Swellings" were also spoken of in this connexion, and were related to eye-movements, especially of the left eye. At length "alertness" was chosen as a more or less suitable term, though it was recognised that it was not precisely what was wanted. The subject noted the similarity between this state of alertness and consciousness of action in the choices; and was very insistent in emphasising the purely mental character of the phenomenon, and in distinguishing it clearly from muscular sensation, strain and effort which might or might not accompany it.

"This consciousness of action is of the same character as or similar to alertness, but much more faint"; "Alertness is conative and so is consciousness of action"; "Can discriminate some sort of phenomenon in designation of the alternative."

Other subjects found the same difficulty in discriminating this dynamic state experienced at the warnings. All finally insisted upon its mental character, and differentiated it from felt muscular tensions, strains and visceral changes. Only a few of their expressions can be given in the space of this chapter, but sufficient to indicate their fundamental similarity.

"Felt some sort of activity going on, could not catch what it was"; "The feeling seemed to fill consciousness"; "Nothing present to consciousness, but a lot going on"; "Seemed a mental movement, distinct from my bodily movement"; "A kind of mental jump"; "A feeling of anxiety, expectation, waiting"; "A tightening of attitude"; "A gripping of the self"; "Experienced something which pulled me together suddenly"; "The feeling of activity seems to grow and then get small again, and with it is the feeling I am stretching my eyes"; "Alertness or excitement[1]; my eyes seem to swell and then go out towards the box"; "At warning signal, a sinking sensation like putting the foot for a step which is not there. I feel it whenever I make a direction of attention. It seems a general muscular tightening with a general feeling of alertness"; "At first 'ready' consciousness seemed to swell. I also had images of eye movements. As if eyes and consciousness were bulging"; "Any noise now gives me the feeling of alertness with its physical accompaniments. Each time the metronome ticks I get a spurt—a feeling of mental alertness" (this subject explained that a *qui vive* is left if we take away the bodily sensations accompanying it); "Considerable alertness, a feeling as if face were swelling"; "Fairly strong alertness at second 'ready.' To speak of it figuratively, as if something were going out of my eyes to the spot fixated. A sort of immaterial emanation towards it. As if I were throwing a light."

This clearly indicates that the predominant processes occurring in consciousness at the warning signals are conative; and the results in Table IV show that a characteristic fall in resistance constantly accompanies them.

What was remarkable in regard to this, however, was the fact that subjects shortly began to report on the relative strength of alertness for each of the three occurrences of it in the same reaction. Thus it was found possible to check their quantitative estimate by the photographic records of the deflections at each signal. The subject was asked to note the alertness at the first signal and to compare the intensity of the experience at the other signals—greater, equal or less—relatively to this. Comparison of the subject's estimates with the objective fall in resistance revealed a marked correspondence.

[1] See Appendix, "Note on Physiological Changes when 'Alertness' is reported," p. 150.

These estimates were made in 316 cases; subject A. yielded 119 correct estimates out of 142 attempts, i.e. 83·8 per cent.; subject B., 72 out of 96, giving 75 per cent.; subject C., 51 out of 78, giving 65·4 per cent. In total of 316 cases 242 corroborated the reports. Where the subject reports great or marked alertness the fall in resistance is proportionately greater than the average of fall for that particular signal; when little or no alertness, there is, most constantly, very little drop in resistance. What seems particularly significant is the fact that in cases where the subject reported not having heard or noticed the signals, there is little, if any, fall; and, where he is directed to pay careful attention to them, there is noticeable increase in it. Indeed, so marked was the correspondence of the introspective report with the deflections, that the experimenter, who was photographing and watching the movements of the galvanometer light in another room, was able to predict to herself the kind of estimate that would be dictated.

There seems sufficient evidence here to corroborate the hypothesis formulated earlier in this chapter. If the hypothesis is true, we should expect deflections wherever there is a release, or partial release, of the subject's latent conative energy. And this seems to occur at the exhibition of the stimulus, and at the signals; which latter can become neglected, with consequent failure in the reflex. Accidental occurrences in experimental procedure bear this out. Any departure from the usual course, claiming the subject's attention, is accompanied by a greatly increased fall in resistance. Several examples of this are given in chapter v, section 1.

Records were taken of the deflections occasioned by "noxious" stimuli, by the process of adding in pairs, the presentation of pleasant sounds, tastes and odours; some with practised subjects, others with children. We find no significant differences between the deflections for the various kinds of mental operations. In all cases a fall in resistance followed the presentation of the stimulus after the usual latent period. What appeared most constantly on introspection was what may be termed the conscious conative effort to perceive this—the direction of "attention" towards it (as distinct from physical effort).

And this is theoretically sound; since, before the stimulus arousing any emotional state can be cognised, there must first occur the conative state involved in some direction of the subject's attention towards it. It is, of course, not denied that other mental processes may also develop; for cognitional sequences are certainly very fre-

quently, and affective at least sometimes, reported in connexion with the perception of these stimuli. But their presence does not seem to invalidate our conclusion. Especially would this seem to be true in view of the fact that the process in question precedes the somatic resonance temporally by at least some part of the latent period.

In the "choices," the great majority of the reactions were over and done with, including consciousness of action, before the full effect of the physiological changes could have entered consciousness as an "emotion." In the "alertness," the mental tension had become relaxed long before the latent period had elapsed. Only on the supposition that the physiological change, as such, is the emotion, and not that which appears to consciousness as the emotion, could it be psychologically maintained that the psycho-galvanic reflex is caused by the experience of emotions. And we may, therefore, conclude—since stimuli to which we pay no attention altogether fail to evoke it—that the regular conscious antecedent to this physico-physiological phenomenon is of a conational nature[1].

The failure of this experimental investigation to discover introspective evidence for the independent development of emotion as a third distinguishable aspect of conscious processes in the act of choice may be examined in the light of two theories which appear to support our findings.

In his analysis of volitional consciousness Aristotle distinguishes, besides cognition, only a faculty of desire (ὀρέξις). It would seem that two aspects must be distinguished in desire, from the subjective point of view:

(1) The affective aspect.
(2) The striving or appetitive aspect.

The one answers to the modern affection, the other to conation. In this view therefore affective states should be regarded as modalities of the functioning of cognitional and conative, but principally conative, processes.

Passing over all subsequent theoretical developments of this question, we may consider the so-called Emotional Theory of Will formulated by Wundt. In this theory, three couples, excitement and depression, tension and relaxation, pleasure and unpleasure, fuse to form a specific emotional development related to the act of voluntary decision. Anticipating some of the facts, we shall establish in our

[1] See Appendix, "Note on the Nature of the Physiological Changes producing the Reflex," p. 151.

subsequent analysis of the act of choosing, it would seem, considering these couples separately, that tension and relaxation correspond to what introspectively is characterised as strain and its absence; excitement and depression appear to be the conative aspects of the whole process and are indicated in the introspections by such terms as "excitement," "alertness," "consciousness of action" and the like; pleasure and unpleasure are primitive static states of consciousness consequent to unimpeded or impeded conational processes.

This appears to fit in with what we find reported. True emotions —fear, disgust, anger, etc.—scarcely ever develop during the motivation period. When occasionally they have been present in consciousness, they are reported as occurring *after* the realisation of the decision

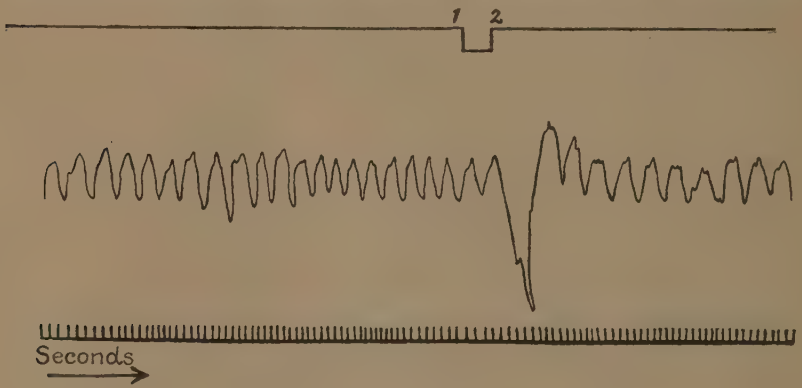


Fig. 3
(*a*)

(the drinking from the glass chosen). On the other hand, primitive affective states, pleasure and unpleasure, are sometimes reported as occurring during the reaction period itself and appear in awareness as relatively stable feeling-tones accompanying, and inferentially resulting from, the trend of the total activity.

The reports show clearly that they develop as states dependent on the voluntary direction of conative activity at the moment of decision, which factor we have shown to be related to the appearance of the psycho-galvanic reflex.

The records of the respiration and pulse proved somewhat disappointing for our purpose owing to the fact that the changes they undoubtedly showed during and after the reaction period could neither be measured accurately, nor differentiated among themselves according to specific peculiarities.

The respiration curve always showed the same characteristics during and after the reaction—a development of shallow breathing (manifesting itself in an alteration of the amplitude of the curve), a slowing down of the rate for several respirations (manifesting itself in an alteration of the wave-length), and a temporary suspension of respiration (manifesting itself in a plateau). Immediately after the reaction there is usually a deep inspiration (see Figs. 3 *a*, 3 *b*).

The characteristics just described appear in all the records covering the period of choice and they are frequently corroborated by the introspective reports.

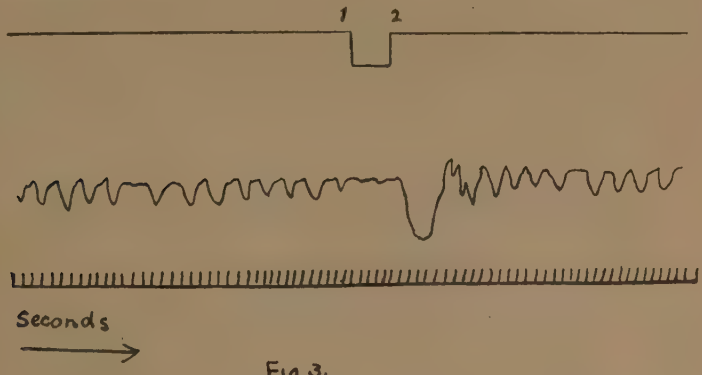


Fig. 3.
(*b*)

The lower tracing is the time-record marking seconds. The stimulus was given at 1, and the reaction was made at 2.

As these characteristics appeared constantly, irrespective of any report of emotional changes, and as the records were not fine enough to admit of the calculation of inspiration—expiration ratios after the method of Burtt and others, it was decided to base no calculation upon them in this research.

At the time of taking the pulse-tracings, the instruments at our disposal were not accurate enough to register minute changes in pulse rate. The taking of them was accordingly omitted in the experiments.

CHAPTER IV

QUALITATIVE AND QUANTITATIVE ANALYSIS OF THE ACT OF CHOICE

On analysing some 900 introspections collected from six subjects, we find that it is possible to reconstruct a typical volitional consciousness agreeing in broad features with that of which Michotte and Prüm have already made an analysis. And while we recognise that the process of choosing is, in reality, a continuous conative one, we shall for the purpose of making a clear analysis of conscious processes occurring during an act of choice, treat it as divided up into five phases:

(1) The fore-period.
(2) The perception of the stimulus.
(3) The development and discussion of motives.
(4) The intermediary period.
(5) The final state, or choice proper.

We shall summarise the points in which our findings corroborate those of earlier investigators, and develop more fully data which appear to advance the analysis of volitional consciousness beyond the point to which it has already been carried by Ach, Michotte and Prüm, and Boyd Barrett.

(1) THE FORE-PERIOD

The fore-period covered the interval between the moment when the subject had adjusted himself mentally and physically to the experiment and the exhibition of the stimulus words. The period was of no fixed length. The taking of the objective records—psycho-galvanic, respiration and pulse—was commenced as soon as the subject was quite ready for the experiment; and usually an interval of 50 or 60 seconds elapsed between this point and the actual exhibition of the stimulus. During this interval, warning signals were given at irregular times.

(1) 1st "ready." This was a signal given to an assistant operator to start the power table which drove the kymograph on which the respiration and pulse curves and reaction times were registered. Ultimately, however, it came to be interpreted by the subject as a warning to himself. This warning became part of the total experiment, and thus took on a peculiar significance for him.

(2) The high, singing note of the Hipp chronoscope in the next room, which was heard by the subject, became for him a second warning of the approach of the stimulus.

(3) 2nd "ready," two seconds before the exhibition of the stimulus, was intended to be a warning to the subject.

In describing our method we noted that the times at which these signals were given were marked synchronously on the photographic records of the psycho-galvanic reflex and on the kymograph records of respiration.

During the course of the experiments one subject spontaneously reported feelings of excitement and alertness at the warning signals (see chapter IV). Accordingly, all subjects were asked to report any changes they might be able to observe in consciousness at these times. By means of the synchronous time-records it was found possible, not only to make an analysis of consciousness from the data given in introspection, but also to relate specific factors reported therein with changes in the objective records.

This whole period is marked by processes of a distinctly conative character. The trend of the conative activity is determined by the acceptance of the task on the part of the subject. This consciously accepted instruction ("Choose for a serious motive; react as quickly as possible: drink"), and a desire to fulfil the obligation imposed by the acceptance, create as Ach has shown, a determining tendency. This tendency, which is volitional in character, guides the conative activity of the subject in a specific direction, and gives to the whole process a teleology for which any mere associative tendency could not account.

When we trace the development of motivation (3) we see the determining tendency functioning in its characteristic form. The instruction, voluntarily accepted before the experiment, but normally out of consciousness during the reaction, is the preponderant factor controlling the whole course of conative activity *during* deliberation. We shall now bring evidence to show that the determining tendency ultimately functions in the same way, *before* the appearance of the stimulus.

Consciousness of the Instruction in the Fore-Period.

We must examine our introspective reports for evidence of a consciousness of the task during this interval, for, as we have said, Ach has shown that normally we are not conscious of the determining tendency created by acceptance of the instruction. If then, the

determining tendency comes to function normally in the fore-period we shall expect to reach a stage in the experiments at which there is complete unconsciousness of the task. We stated (chapter III) that the instruction was repeated to the subject daily before each sitting (seven experiments). The same form of words was always used, and its place in the procedure was never varied.

In the earlier experiments of the investigation it was common for the instruction to be explicitly present to consciousness (usually verbally or auditorily) in the fore-period. During the first experiments of all, most subjects repeated the instruction sometimes with inner speech, sometimes even aloud. E.g.:

A. 187. "In the fore-period I was acutely aware I had to choose for a good reason."

B. 18. "On the first 'ready,' a good deal of alertness; for a moment, I thought it was the second. Was conscious of repeating the instructions in the period that followed."

B. 46. "Between the 'clock' and the 2nd 'ready' I had a very complex mental content....I made up my mind that the next choice should be a good one, i.e. that there should be full deliberation."

B. 75. "After 2nd 'ready,' a decision to make great effort to make a good choice and a quick reaction."

C. 68. "At 'clock,' a swing of attention, with slight surprise; an active swing. In period after the instructions were passing through my mind."

E. 33. "At 1st 'ready' was yawning; stopped short; found myself in a state of blankness—not exactly tranquillity; there was nothing there. Was feeling a lot was happening, but there was nothing in consciousness. This continued until after the 'clock.' Then the instruction came up verbally, quite complete."

E. 34. "At 1st 'ready' eyes became fixed on the shutter, and I became entirely occupied with the instruction."

F. 112. "After 1st 'ready,' a tendency to repeat the instructions," and F. 104, "Period filled with pulsations of reminding myself of the task with the words 'multiply or divide.'"

As the novelty of the procedure passed away subjects often reported that the instruction was present in a schematic, fragmentary manner. Sometimes one word only of the task, e.g. "choose," remained verbally or auditorily in consciousness. In such a case the one word functioned as a symbol for consciousness of the whole instruction. E.g.:

B. 29. "At 1st 'ready' conscious of excitement. There was also some alertness but at that time I had no clear perception of the end of my attention. Later parts of the instructions reappeared."

B. 2. "The words seemed to come—visually—'choose'; 'choose'; 'choose.'"

A. 188. "In fore-period was obsessed with the notion the choice was going to be *Ziv-Vab.*"

D. 82. "Found myself wondering if tastes would be *Ziv-Vab.*"

E. 43. "2nd 'ready' caused commotion; with verbal imagery: 'I must be quick.'"

E. 18. "At 1st 'ready,' a sort of tightening up. Tried to recollect what I had to do. Confused state; great effort. Finally recollected I had to notice reasons for choice."

F. 106. "'For a good reason' just before opening the shutter."

F. 109. "In fore-period 'multiply' or 'divide' said once: 'Good reason' verbally presented." (This experiment was during the period of giving mathematical alternatives.)

F. 110. "Instruction present in an abbreviated form in fore-period of waiting. 'Multiply' or 'divide' clearly present after 2nd 'ready.'"

Later it seemed common with all subjects for consciousness of the instruction to pass into a third phase on its way to complete unconsciousness. In this phase knowledge of the task was only present in an intentional manner. The subjects could find no trace of verbal or other imagery connected with it; and it was more or less implicit. It was not unusual in such cases for the subject to report that there was a consciousness of preparedness for the task. They felt that everything would go well; that they were ready to do the "right thing" at the "right time," although "thing" and "time" were not explicitly present to consciousness at all. E.g.:

B. 53. "At 1st 'ready' considerable alertness; a violent swing of attention but no clear knowledge as to what I had to attend to, or why I had to break off train of thought."

C. 42. "At 1st 'ready' a bracing up of attention and a kind of prepared feeling."

C. 64. "A bound of attention to the shutter; 'Plenty of time.' Not a clear conscious knowledge of this: was there in a vague sort of way." And C. 65. "A general feeling of readiness for the task."

E. 21. "There was present in an intentional way, a knowledge of the task. A feeling I should be able to carry it out."

E. 24. "Felt I knew the instructions, but they were not present."

E. 32. "The actual instructions never got present verbally, but I felt I knew them." And E. 41 "Felt confident I knew what to do."

F. 46. "A concentration of attention on the shutter at 2nd 'ready.' A relaxation: 'It will be all right.'"

F. 57. "At 'clock,' a voluntary setting of attention, followed by an attitude which is held and gives satisfaction and carries the awareness: 'All is going as expected.'"

All subjects finally reached a stage in the experiments when they were completely unconscious of the task even during the fore-period. Attention was not infrequently occupied with extraneous contents; and yet at the exhibition of the stimulus the whole process of choice developed on the lines laid down by the instruction.

The influence of the accepted instruction during the fore-period can also be seen in a very commonly reported phenomenon, viz: the shrinking or narrowing of consciousness. When the procedure has become more or less habitual, all subjects are struck by the meagreness of their cognitive content at this stage. E.g.:

A. 282. "At the signals consciousness shrinks a little. At the last pulse of attention its range was very small, and I was conscious of no muscular tension."

B. 68. "'1st ready' caused a rapid swing of attention to the task. While I was called up thus, consciousness seemed to be an entire blank from objective content; but my whole consciousness seemed to be filled with an intense feeling of activity. This seemed to continue with fluctuations until the shutter fell."

B. 59. "At 1st 'ready' consciousness narrowed, and seemed to glow more intensely."

B. 22. "The 2nd 'ready' seemed to catch me at a low ebb of attention. A fresh concentration. After this I was conscious of no other content, mental or sensory, until the shutter fell."

E. 30. "At 1st 'ready' my train of thought seemed to become less intense and to fade out slowly until I could not catch it, but something seemed to be going on."

E. 37. "At 1st 'ready' fading of cognitive content more rapid. At 2nd 'ready' confusion. Could catch nothing. Had to make definite effort to overcome it; entirely a mental effort: could find no accompanying physical strain or effort. Conscious of nothing but this mental effort: no noise etc."

This is not a unique fact confined to our experiments; it has been reported by subjects and commented on by all investigators of the process of attention. What is of interest here is the evidence it provides for the functioning of the determining tendency during this period. The emergence into awareness of irrelevant associations is inhibited by this tendency; only such portions of immediate experience as have their place in furthering the trend of conative activity of the moment (i.e. the choice) are normally allowed to emerge into clear awareness. The chief items of experience which reach clear cognition are the three "warning" signals already mentioned. These have their place in the unfolding scheme of conative processes. In their setting they have a definite meaning for the subject.

Other items of experience *may* reach awareness on account of their

quality or intensity, e.g. a novel element in the customary procedure, or a sudden loud noise. When such is the case their interference with the normal course of conative activity is marked by unpleasure and annoyance, as well as by characteristic changes in the objective records. E.g.:

C. 27. "Towards the end of the period attention swung to a noise outside. Clock was heard in the background while attention was fixed on this noise. Pulled myself up to the task. Attempted to get a quick concentration against the noise outside."

D. 99. "Disturbed by noise of door. This interfered with my mental attention and jarred me physiologically."

B. 49. "Was worried when 1st 'ready' was given because somebody was prowling about outside. Felt I had to make a violent effort to fix my attention."

Changes at the Signals and other Stimuli during the Fore-Period.

It is of interest in this connexion to examine the changes in consciousness reported at the signals and at other accidental stimuli, and to investigate the changes in the objective records which invariably accompany them.

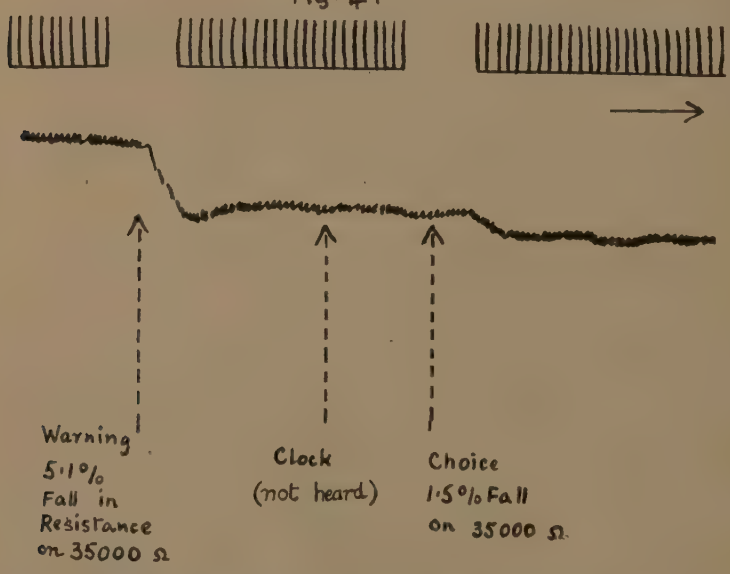
In the evidence put forward in establishing the thesis that the psycho-galvanic reflex is preceded by changes of a conative rather than an emotional character, we gave an analysis of processes observably in consciousness when these "warning" signals are cognised. Over and above cognition of the stimulus, our subjects found awareness of changes in their conative state. From the expressions chosen to characterise these changes it seemed clear that all the subjects were making efforts to report their cognition of experience of a conative character ("consciousness of action," "alertness," "excitement," etc.; see pp. 26 and 121). We also noted that a characteristic deflection on the psycho-galvanic record invariably followed this experience (Table IV, p. 26). We concluded that an intensification of the subject's conative state (by a warning, for example) tended to pass into awareness as a feeling of "alertness," "*qui vive*," "preparedness to act," and to be indicated on the psycho-galvanic records by a marked fall in resistance. There was evidence for believing that we should expect a fall in resistance whenever there was a release or a partial release of the subject's "latent" conative energy during the "waiting" period. The adequate stimulus for the normal liberation of this energy is the appearance of the alternatives; but every stimulus of which the subject becomes aware while he is in this state of tense waiting causes a partial release, and a resulting fall in resistance.

It will be illuminating here to compare the percentage falls in resistance for each group of 14 experiments (two sittings). This will at once reveal the effect of repetition upon the power of the accepted task to inhibit this release of energy at stimuli other than the adequate stimulus.

Table V.

Experiments	Subject B		Subject C		Subject A	
	% fall in R. at 1st "ready"	% fall in R. at chronoscope	% fall in R. at 1st "ready"	% fall in R. at chronoscope	% fall in R. at 1st "ready"	% fall in R. at chronoscope
1— 14	6·0	2·1	9·7	6·3	2·8	·5
14— 28	3·3	·8	4·9	2·4	1·7	1·3
28— 42	3·0	·5	2·6	·9	1·66	·46
42— 56	1·6	·7	3·35	1·6	·9	·7
56— 70	·9	·25	1·4	1·3	1·6	1·0
70— 84	·8	·6	1·3	·8	2·3	·4
84— 98	—	—	1·1	1·03	·8	·3
98—112	—	—	—	—	1·0	·5

Fig. 4.



Here we see that the signals have their maximum effect in the earlier experiments; in these groups we get larger falls in resistance and a reference to the introspections reveals more noticeable changes in consciousness. As the experiments proceed, attention to the

warnings becomes more habitual. When this is the case the subject reports very little observable change in consciousness; and we note a correspondingly small deflection on the psycho-galvanic records.

Sometimes the subjects reported that they neglected the warning. Occasionally they failed to hear it when it was given. In these cases there is a total failure in the appearance of the reflex. The accompanying figure (4) shows a typical photograph when such is the case.

Fig. 5.

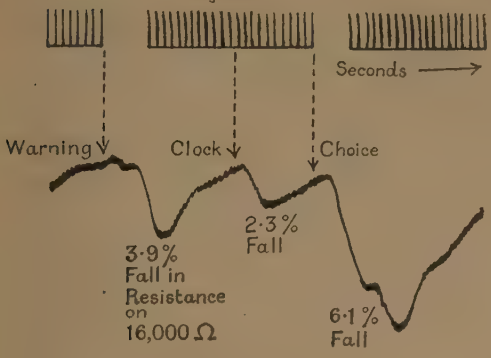


Fig. 6

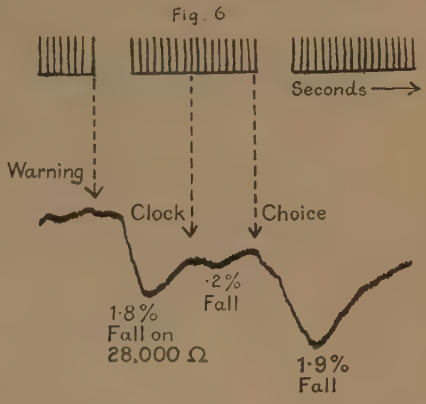
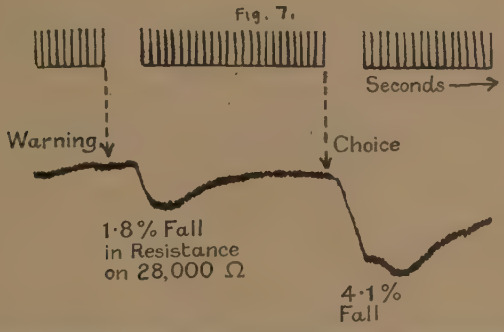


Fig. 7.



With all the subjects the sound of the Hipp chronoscope produced the least change in consciousness and was accompanied consistently by the smallest fall in resistance. (See Table IV, p. 26.) Also, under the influence of repetition, the release of conative energy tended to be inhibited earlier in the course of the experiments. The accompanying photographs are typical of cases in which:

(1) The reflex, following this stimulus, is of normal magnitude. See Fig. 5.

(2) It has almost died out. See Fig. 6.

(3) It has completely disappeared. See Fig. 7.

With regard to the release of conative energy at stimuli other than the signals, we find that any departure from the usual course of procedure, claiming the subject's attention, is invariably accompanied by a greatly increased fall in resistance. E.g.:

"Annoyed by noises in the corridor." See Fig. 8.
"Tried to inhibit a sneeze." See Fig. 9.
"Did not hear the first signal and the clock startled me." See Fig. 10.

Many examples illustrating this quantitative relationship between the release of "latent" conative energy and the appearance of the reflex might be given from the introspective records of all the subjects. Those cited, however, appear to be sufficient to support the point we wish to make here, viz. that during the whole fore-period the subject is in a state of suspended conative activity: that the determining tendency is on the whole sufficiently strong to inhibit its discharge until the appropriate stimulus is given, but that it cannot completely do so, if a stimulus relevant to the general trend of development appears, or if a quite unexpected experience forces its way into awareness.

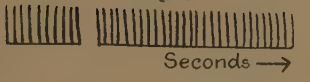
Consciousness of Muscular Sensations in the Fore-Period.

Muscular sensations from chest, neck, jaws and eyes; tactile-pressure sensations of tongue against the lower teeth; pressure sensations from the finger tips on the key; muscular strain in the forearm; a vague, undifferentiated sensation characterised as strain; all these were reported from time to time, as being in consciousness during the fore-period.

When establishing our point with regard to the conative character of the reflex we brought forward evidence to show that these muscular sensations, strains and tensions of which the subjects become aware are distinguished very clearly from changes in consciousness which they characterise as "mental," and designate as "consciousness of action, alertness," etc. (see pp. 26, 121).

Changes in breathing were reported by all subjects and were related to some specific point in the procedure, i.e. to one of the warnings, or to some noise or accidental occurrence. It was found possible to check this report of awareness of such changes by the objective records of the changes themselves. It was not possible to obtain anything but the roughest quantitative measure of the variations in respiration accompanying the cognition of these stimuli.

Fig. 8



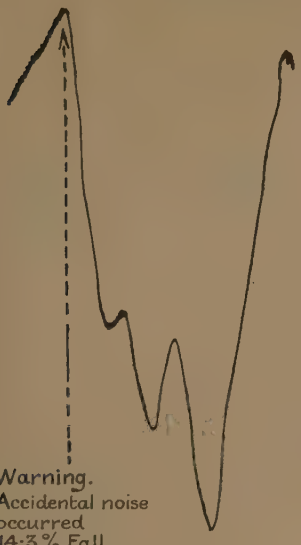
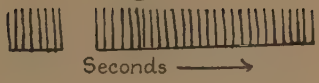


Fig 9.



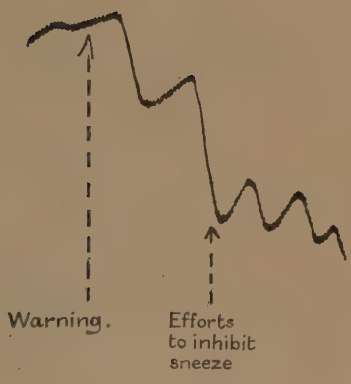
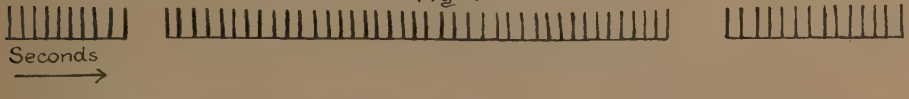


Fig 10.

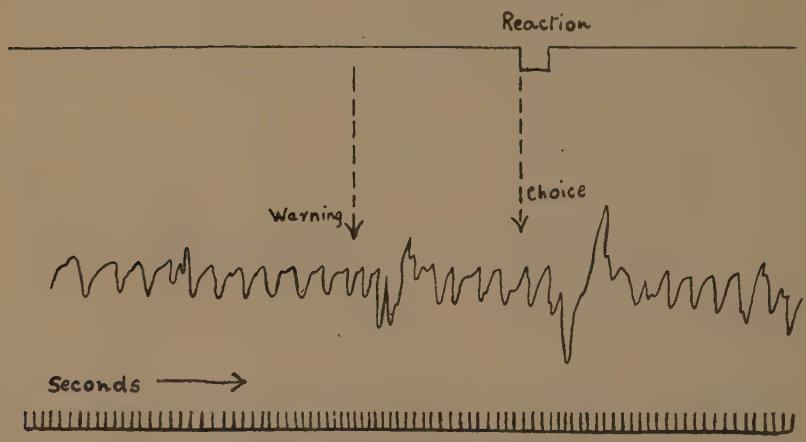


We have, however, examined a sufficient number of pneumograph records (300) to formulate the following general conclusion:

During the fore-period respiration is normal and regular except at the "warning" signals or any unexpected stimulus, when it is momentarily suspended and then followed by a deep inspiration.

The following record illustrates this:

Fig. 11.



Exhibition of the Stimulus.

The fore-period ends with the fall of the shutter and the exhibition of the stimulus words. From this point to the end of the reaction the conative processes develop under the influence of the determining tendency. Motives brought into play by the instruction emerge into consciousness; action is inhibited until an alternative is voluntarily designated, the last step in the whole chain being the putting out of the hand to take a glass and so complete the realisation of the task.

It was quite common for subjects to report that they were able to discriminate two "pulses" of alertness, which coincided with awareness of the second "ready" and the fall of the shutter two seconds later. The obviously composite nature of some of the psychogalvanic curves indicates that two successive falls in resistance took place. Allowing for the latent period of the reflex, these are found to be related in time to these two stimuli. See Fig. 12, A and B. The following introspections were given:

A. "At second warning, about the same amount of 'alertness' as at first. After shutter fell there was an effort of attention and more 'alertness.'" (A. 276.)

B. "At second warning a little more 'alertness' than at first. Considerable 'alertness' again at fall of shutter. A second pulse." (A. 256.)

It is a very unusual experience for consciousness to be quite bare of introspectible cognitive content during this period of two seconds. At the second "ready" consciousness becomes limited to a very narrow span.

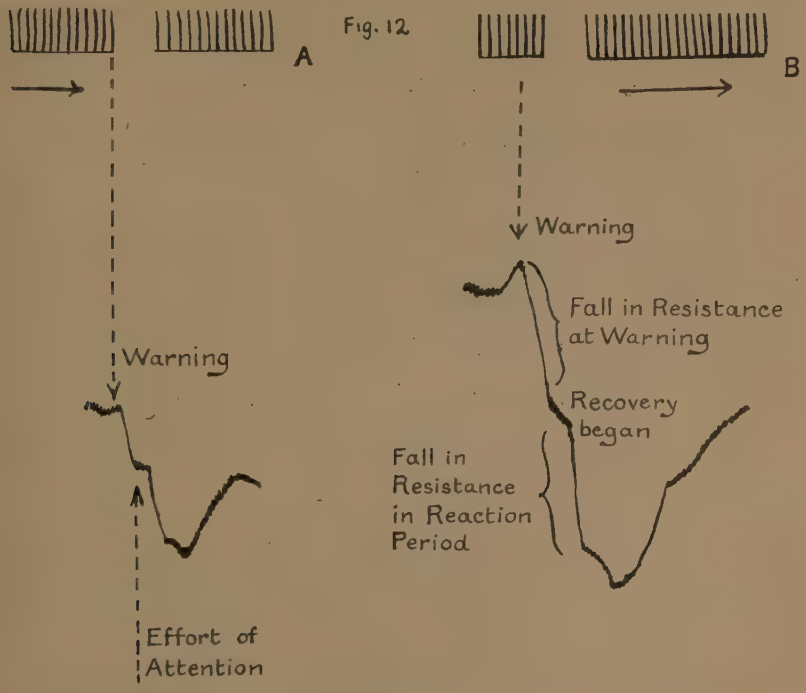


Fig. 12.

Muscular feelings, etc., which have been present to consciousness, drop out. The instruction, which may have been repeated previously, fades away. In this period experience may be said to be predominantly conative in character; it tends to pass into awareness as does any other kind of experience[1], but it does so in a way very vague and difficult to characterise. Nevertheless, even when consciousness is as bare of cognitive content as it is at the moment immediately preceding

[1] See First Principle of Cognition: "Nature of Intelligence and the Principles of Cognition." Spearman, p. 48.

the exhibition of the stimulus, two items are clearly in awareness, though the expression of them in the dictated introspection is sometimes clumsy, obscure, and even misleading. These two items are:

(1) A consciousness of striving; consciousness of action; alertness.

(2) A consciousness of "self," i.e. of the self which is striving.

These are very important items in volitional consciousness, and evidence for them will be fully developed in later chapters (chs. VI and VII).

2. PERCEPTION OF THE STIMULUS

In discussing this phase of the experiment it must be remembered that our method, while agreeing in general with that of Boyd Barrett, differed from that of Michotte and Prüm. In our research, processes entering into the appreciation of the alternatives proposed for choice followed a different course. With the material which we used, evaluation of the eight possible alternatives had been made with more or less completeness during the preliminary tasting experiments, the purpose of which has been explained in our chapter on method. At the end of the formation of the associations it will be remembered that each subject was asked to write down his own estimate of the value order of the tastes. Thus, for our subjects, the stimulus words immediately presented the two alternatives. Michotte's subjects had to evolve possible alternatives after the stimulus numbers had been fully perceived—thus these alternatives had to be developed *de novo* in each experiment. In our research the stimulus words presenting the alternatives quickly came to function as language words, normally carrying a meaning and a clearly defined value. This makes the division of the two phases—Perception of the Stimulus and Development of Motivation—in our experiments an artificial one. Given the stimulus word we get the meaning and value; given the values we get motivation; given motivation we get choice. These processes develop continuously but very rapidly. With repetition they tend to become condensed. We shall show, when discussing Development of Meaning, that they come ultimately to be given as part of the Percept of the Stimulus word. In Michotte's experiments Perception of the Stimulus had to be complete and detailed before other processes connected with choice could develop. It was rarely, if ever, possible for the alternatives to be given as part of the percept of the stimulus numbers. Bearing this in mind, we can now proceed to discuss the various factors entering into Perception of Stimulus.

Cognitional Blank at Exhibition of Stimulus.

At the moment when the shutter opened and the stimulus words appeared it was usual for the subjects to experience what they termed a "blank." Their introspections show that this was a state of consciousness relatively empty of objective content. E.g.:

B. 16. "Mind seemed a blank as shutter opened." (77) "For a moment I saw the syllables but could not take them in." (84) "Swing of attention to task in hand, and a fading of all other contents." (85) "When shutter opened, found me in utter confusion. Could not recognise either of the syllables, and stared helplessly for a moment."

A. 13. "*Zul-Jor*, repeated three times. Sort of arrest of everything." (78) "At appearance of stimulus there was a little inhibition. Words seemed familiar, but had no meaning. Sort of groping for a meaning. A consciousness of action, like when one tries to remember a name." (282) "Consciousness shrinks a little. At last pulse of attention—opening of shutter —it was very small and I was conscious of no muscular tension."

D. 13. "A sort of blank when shutter opened and I saw the words. They meant nothing." (14) "Whole field of consciousness seemed to be smoky: accompanied by a physiological feeling. Then out of this *Tauk* jumped like a flash of light." (17) "Same feeling of strangeness. During this time I was not conscious of any mental content at all."

E. 31. "A momentary blank." (38) "All that seems to happen is the fading of the line of thought, leaving no cognitive content." (41) "Excitement and mental alertness at fall of shutter: difficulty in taking in the alternatives."

F. 20. "Awareness shutter was open. All else dropped." (32) "All momentarily obliterated by rapid opening of shutter. '*Mep-Vab*' seen but not clear." (44) "Saw shutter drop. '*Ziv-Tauk*' seen. Pause, apparently empty." (53) "A blurred period in which thought of shutter movement coalesced with vague awareness words were there. This developed into awareness the meanings were not there."

As we saw, at the sound of the opening shutter, of the clockwork in the next room, of the distant traffic, muscular sensations from eyes, forehead, mouth, face, neck, chest, arms, fingers, etc., sink out of awareness. The two syllables themselves often appear even meaningless for an instant. This phenomenon is of such universal occurrence that we examined the introspections for any facts which might possibly throw light upon it.

We have to note that the subject is adapted to make a choice, the appearance of the stimulus being the signal that the conative activity which has been held in check during the fore-period may now follow that course of development determined by the instruction. Experience at this moment is predominantly conative, for it is the instant when the subject is making his direction of intention to the stimulus

words, of which it is important for him to have the clearest possible cognition. If this experience of action enters awareness—and there is no reason why it should not—it must do so in its conative character. This awareness of sudden changes in the conative state is very vague and difficult to express; more particularly is this so because in everyday life we do not isolate our consciousness of these transitive states since attention is so quickly usurped by the more vivid and interesting objective contents. It is only in the course of systematic introspections that we become aware of elements in consciousness that we have not before tried to describe.

All our subjects felt that there were processes of some kind going on, but that they could not at first be satisfactorily named. E.g.:

F. 19. "I lost something." (20) "Felt some sort of activity going on but could not catch what it was. Something *was* going on apparently under the threshold of consciousness." (21) "This feeling seemed to fill consciousness." (34) "Caused a disturbance of some sort, quite momentary."

D. 24. "A feeling of alertness, accompanied by some sort of sensation I can't describe." (30) "At signal my mind is like a hound in leash." (32) "Something I am missing."

A. 84. "I can find at this moment a certain excitement, no affective feeling."

B. 7. "Experienced something which pulled me together suddenly." (23) "A kind of mental jump to task when shutter opens."

"Shock," "astonishment," "surprise," "excitement," "pulses of consciousness," "mental tension," "swellings of consciousness," "mental direction," "swings of attention" were also often reported, and were definitely related to the moment when the shutter opened to exhibit the stimulus words. Several subjects, independently selected "alertness" as a suitable term to describe these changes in consciousness, and, although all finally accepted it as perhaps the best to characterise their experience, they realised that it was not precisely what was wanted[1]. All subjects reported on the similarity of their conscious experience at the moment of the appearance of the stimulus words, and that occurring at the "warning" signals—see chapter v, section 1. Having once found a suitable expression for their awareness of this conative experience, they used it on both occasions.

These facts appear to account, to a great extent, for the "blank" which was so often reported. The "blank" had clearly to do with the lack of objective content. The stimulus had not yet reached clear cognition, and awareness of the conative experience involved in the

[1] The English vocabulary, however, does not appear to contain a word which more nearly characterises the phenomenon.

direction of attention towards it was too vague and novel for subjects at first to express easily.

Normally this "blank" is only of momentary duration, for unless bad adaptation interferes with the usual course of development of the subsequent processes, the stimulus words are at once perceived, their meaning becomes clear, and motivation develops: i.e. consciousness again becomes occupied with objective contents which are more easily described and expressed.

But before dealing with the Development of Meaning it will be convenient to examine at this point the effect of space order upon the Perception of the Stimulus words.

Influence of Space Order.

The distance of the card on which the names of the alternatives were presented was adjusted so that the whole of the visual stimulus fell on the point of clearest vision. Thus it was possible for the two alternatives to be perceived as a unity. Subjects sometimes reported that this was the case. E.g.:

E. 42. "Aware of both alternatives simultaneously and of their meaning."

C. 22. "*Tauk-Vab* was seen like one presentation."

D. 88. "Seemed to recognise words simultaneously."

B. 3. "I seemed to see the two alternatives as one presentation; am not conscious of looking at either one or the other first."

The general rule, however, was to read in the habitual way from left to right, and for the meanings to develop successively in that order. This being the case, we felt that the order in which the alternatives were cognised might be a factor influencing the choice. There were reports in the introspections that the first alternative of which the subject became aware appeared to be the one favoured at the end of the motivation. E.g.:

A. 22. "Have a repressed tendency to choose the one the meaning of which comes first to consciousness."

D. 77. "Both recognised simultaneously, but not with equal clearness. *Jor* clearer in consciousness because to the left, I think."

C. 20. "Read *Tauk* which seemed more in focus of attention when shutter fell. Seemed a tendency for me to make a half-formed choice on account of this."

On the other hand it was sometimes remarked that there seemed to be a tendency to choose the second alternative. E.g.:

D. 2. "I am influenced by the one seen last." (3) "Had to react against the tendency to consider the last alternative."

B. 23. "I dwelt on *Mep* as the last one read."

To investigate this point, alternatives were arranged in two space orders, left-right and right-left; for example if, Jor-Vab was given in one sitting it was repeated in a later sitting as Vab-Jor. Boyd Barrett omitted to do this and it was thought that possibly an important influence on the Development of Motivation might thus have been overlooked in his research[1]. Allowing for the reversed space order the eight tastes employed permitted of 56 possible combinations; as seven combinations composed one day's set, and the subject completed one set each day, it will be seen that every combination was presented once at the end of eight days.

The following is a specimen of the tables which give the results of this investigation and the classification of the data on this point.

Table VI[2].

Subject A.

1	2	3
Alternatives	Times Presented	Times Chosen
Jor —Vab	5	Jor, 5.
Vab —Jor	4	Jor, 4.
Jor —Mep	6	Jor, 6.
Mep —Jor	3	Jor, 3.
Jor —Laip	7	Jor, 5. Laip, 2
Laip—Jor	4	Jor, 2. Laip, 2
Vab —Mep	4	Vab, 1. Mep, 3.
Mep —Vab	6	Vab, 5. Mep, 1.
etc.	etc.	etc.

It will be seen that column 1 gives the alternatives presented. The same alternatives in the reverse space order are given in alternate lines. Column 2 gives the number of times each combination was presented, and column 3 the results of these choices. Column 3 will, therefore, show whether the result of the choice has been consistent throughout. If it has not it will show whether the change in space order is related to the change in preference. The choices where there seems to be evidence of such influence are marked with an asterisk in Table VI in Appendix III. Reference to these Tables shows that from the results of the choices alone, the cases where the first alternative seems to be favoured consistently are very few:

A. 4 out of 28. B. 5 out of 28.
C. 2 out of 28. D. 1 out of 28.
E. 1 (?) out of 28.

[1] Boyd Barrett, *Motive Force and Motivation Tracks*, Longmans, Green, and Co., 1911.
[2] See full table for all subjects in Appendix III.

Therefore the objective results of the choices do not provide sufficient evidence for the assumption that the order of presentation of the alternatives has any influence on the choice. Even what little evidence there might be, however, disappears when reference is made to the introspective reports. All the asterisked cases have been examined for facts concerning perception of the stimulus, development of meaning, course of motivation and reason for choice; and in no single case have we any reported tendency for the subject to favour a certain alternative because he became aware of it first. We therefore feel justified in drawing a negative conclusion: in these experiments the order of presentation of the alternatives had no ascertainable influence on the resulting choice.

Influence of Degree of Consciousness for the two Alternatives.

Detailed examination of the reports, however, revealed another factor in perception of the stimulus. We refer to the degree of consciousness for the two alternatives. We stated earlier that it was the general rule for the subject to read the alternatives from left to right and for the meanings to develop successively in that order. There is, however, frequent evidence of the fact that although the meanings do usually develop in that way, they do not always rise to an equal degree of clearness in consciousness. Often there is a higher degree of awareness for one of the alternatives: it takes on a "luminosity in consciousness"; it develops a "brilliant meaning," while the value and meaning of the other alternative may be only vaguely defined. E.g.:

A. 118. "*Mep* had more meaning than *Laip.*" (129) "Then '*Vab*' very unpleasant and very prominent." (133) "*Ziv* was prominent in consciousness; *Mep* was a sort of fringe." (150) "*Zul* with clear unpleasant meaning. *Tauk* without much meaning."

B. 11. "Conscious first of presence of *Mep.*"

C. 5. "*Zul's* meaning more prominent." (9) "*Ziv-Mep* present auditorily, especially *Ziv* which seemed stressed." (73) "*Tauk* seemed prominent and almost filled consciousness."

D. 27. "Recognised *Tauk* with great distinctness immediately. Its clearness seemed to obliterate *Vab.*" (72) "*Vab* suddenly took on a clarity which the other did not have."

F. 7. "*Klum* with awareness it is acid and not very desirable. Present before the blur which represented the other was recognised." (17) "When shutter opened, *Ziv* was instantly in clear focus of vision and attention with *Klum* in the margin of both."

D. 47. "Saw both as words at first. Suddenly *Ziv* became the centre of the field."

It was felt that this element in the perception of the stimulus might prove a more important factor in determining the course of motivation and the subsequent choice than had the order of presentation of the alternatives. Accordingly all the introspections were examined with a view to discovering the frequency with which the subject stated that the meanings appeared with unequal clearness in consciousness. The details of these choices were tabulated according to the following scheme, so that the facts required were easily ascertainable:

N. of Expt.	% fall in Resistance	Reaction Time	Alternatives	Alt. Chosen	Extracts from Introspection
12	7·3	2570	Klum-Mep	Klum	Meaning of "nasty" one prominent. Consciousness of Action at designation. Relief-pleasure. The dominant "nasty" nearly determined the choice at one point, etc.

From these tables[1] summaries were made, the purpose of these being to show at a glance whether the alternative of which the subject was more vividly aware, was the one ultimately chosen. Table VII gives two such summaries, for Subjects A. and C.

An examination of these tables enables us to draw the following conclusions on this point:

(1) A higher degree of consciousness for one alternative does not appear to exert a very marked influence on the determination of the alternative actually chosen. The percentage of cases in which the alternative rising to the higher degree of consciousness was ultimately chosen was 33⅓ in A. and 22 in C. We cannot, therefore, with any degree of confidence, place degree of consciousness as a factor determining the ultimate choice.

(2) A correlation does however appear to exist between the place of a given alternative in the scale of value[2] and the degree of consciousness. Alternatives possessing an extreme positive or negative value show a marked tendency to rise to the focus of awareness. The percentage of cases in which an alternative having an extreme negative value rose to the higher degree of consciousness was 66⅔ in A. and 66 in C. The percentage of cases in which the alternative having an extreme positive value rose to the higher degree of consciousness was 33⅓ in A. and 18 in C.

[1] These tables of the chief details reported in the original introspections were made for all subjects. They proved of great use and convenience for the purpose of taking a quick survey of the facts on which conclusions could be based.

[2] See p. 66, column 1. These are the hedonic values of the tastes as estimated by each subject.

The introspective reports of these choices show, however, that this in itself seldom influences the ultimate choice which is only made after complete examination of the two alternatives. We shall return again to this topic when discussing the influence of value on the choice.

(3) Indifferent alternatives show no tendency to rise to a higher degree of consciousness.

Table VII. Relation between degree of consciousness for the two alternatives and the subsequent selection.

Subject A.				Subject C.			
No.	Alternatives	Alt. in focus	Alt. chosen	No.	Alternatives	Alt. in focus	Alt. chosen
49	Zi. M.	M.	Zi.	1	J. Zi.	J.	Zi.
54	M. T.	M.	T.	3	L. K.	L.	L.
57	T. J.	T.	T.	4	T. M.	M.	T.
65	Zi. Z.	Z.	Zi.	5	K. Z.	Z.	Z.
68	J. M.	M.	J.	6	M. T.	M.	T.
69	Zi. V.	V.	Zi.	7	Zi. J.	Zi.	Zi.
73	J. Z.	Z.	J.	9	Zi. M.	Zi.	Zi.
78	L. T.	T.	T.	10	M. K.	M.	K.
79	V. Zi.	V.	Zi.	11	V. T.	T.	T.
84	Zi. L.	Zi.	Zi.	13	J. T.	J.	T.
88	V. K.	V.	K.	16	K. V.	V.	K.
93	J. Zi.	Zi	Zi.	17	L. V.	V.	L.
105	Zi. J.	Zi.	Zi.	19	Z. Zi.	Z.	Zi.
106	M. T.	M.	T.	20	T. Zi.	T.	Zi.
107	K. V.	V.	K.	21	Z. J.	Z.	J.
112	L. V.	V.	L.	22	T. V.	V.	T.
116	T. V.	V.	T.	32	J. M.	M.	J.
118	L. M.	M.	L.	36	L. J.	L.	L.
120	Zi. K.	Zi.	Zi.	48	L. V.	V.	L.
129	J. V.	V.	J.	52	K. V.	V.	K.
133	Z. M.	Z.	Z.	55	T. L.	L.	T.
139	V. Zi.	V.	Zi.	56	S. Z.	S.	Z.
143	Zi. L.	Zi.	Zi.	57	C. L.	L.	C.
145	Zi. T.	Zi.	Zi.	58	K. V.	V.	K.
146	V. K.	V.	K.	67	K. Z.	Z.	K.
149	V. L.	V.	L.	70	Z. T.	T.	T.
150	Z. T.	Z.	T.	73	Zi. T.	T.	T.
163	V. T.	V.	T.	78	K. Z.	Z.	K.
169	K. T.	T.	T.	85	Zi. M.	M.	Zi.
203	Zi. V.	V.	Zi.	92	K. V.	V.	K.
				98	Z. J.	Z.	J.
				112	L. V.	V.	L.

Development of Meaning.

In spite of the marked individual differences amongst our subjects in respect of the manner in which the meaning of the alternatives was revived, it has been possible to show the presence of certain general tendencies at work in the processes concerned with this. Although no hard and fast divisions can be made, the following

stages towards a gradual schematisation in the development of meaning are indicated more or less clearly.

(1) *The Meanings develop as Individuals.*

(*a*) Gustatory, kinaesthetic or tactual images, representing more or less completely some feature of the taste itself, were found in the very early stages of the experiments. This was quite common with subjects B, C, D, and E, occasional with F, and completely absent with A. E.g.:

F. 14. "As I read *Klum*, a very faint gustatory image."

F. 39. "Taste image with *Klum*."

F. 15. "Some gustatory imagery. I could actually taste *Ziv*."

B. 5. "Had a reproduction of the sticky touch of this heavy, slimy liquid."

B. 50. "Was thirsty and thought I should like the acid taste of *Klum*."

C. 24. "Was aware of the sweet taste of *Laip* when I made choice."

D. 6. "Images of *Tauk*—taste—accompanied by warmth in palate."

D. 16. "Vague feelings in palate when *Vab's* meaning came...."

D. 59. "Then swung over to *Klum*. Recognised it by its accompanying kinaesthetic sensation."

D. 70. "Recognised *Klum* as sour, not unpleasing; puckering sensation at base of tongue."

D. 90. "Recognised *Vab* with a sort of mental shudder, and an ill defined, weak, visceral sensation."

A. 25. "I have no representation of the actual taste, no taste images."

D. 93. "Then *Mep* began to take some clarity as a distinctive taste."

(*b*) Verbal imagery was also frequently present when the meaning emerged, and served to express the concrete taste value of the alternatives as they had been appreciated. It rapidly replaced the gustatory imagery when this had been present, and it also appeared in subjects who had had no such imagery (A. and F.). Sometimes the absolute value of the alternatives was made explicit by means of a sentence or fragment of a sentence. E.g.:

B. 46. "*Klum* with awareness it is acid and not desirable. Something in the background holding me from taking *Klum*. This became 'acid action of teeth.'"

B. 21. "*Klum* is acid" and "*Tauk* is sweet." The actual words.

B. 114. "*Laip, Klum*, middle doubtful zone. Then, 'Milk is better than acid.'"

E. 21. "*Jor, Mep*, with verbal imagery. '*Mep* is salt.' Could not get a gustatory image with *Jor*. Also failed to find a word. Felt I ought to know it. A definite search; slight displeasure."

More commonly, however, one word, for example, "sweet," "milk," "acid," "orange" came to function as a symbol expressing the

absolute taste value. This occurred commonly with E. and F. but was seldom met with in A., B. and D. F. indeed evolved a complete scheme of such terms during the formation of the associations[1]. These terms expressed the absolute taste value clearly for him, and development of meaning was scarcely ever made without reference to them. E.g.:

F. 56. "*Klum-Laip*, general meaning present. Then *Laip* became 'milk,' and *Klum* became 'acid.'"

F. 8. "Read *Tauk*; aware it was 'orange.'"

F. 42. "Rapid shift to *Vab*. End of this left *Vab* clearly BIC."

F. 114. "*Laip-Klum* carried significance in a vague way, of tastes. The two then discriminated more clearly and actual values as tastes developed enough for me to get the words, MILK, ACID."

E. 4. "The word 'salt,' with unpleasant association of being made thirsty."

B. 4. "Seemed to jump upon the other alternative. Had an image—visual —of the word 'acid.'"

Thus it is clear that in the early part of the experiments there was a tendency for the alternatives in the choice to be revived explicitly in some way, as two definite, concrete things, and for them to be weighed one against the other according to their absolute value.

(2) *The Meanings Develop as Types.*

At this stage verbal imagery was still sometimes reported; but, when it was employed, it no longer expressed the concrete taste value. The expressions used showed that the alternatives had been subsumed under concepts, and that their values had come to be appreciated by reference to abstract, general ideas. E.g.:

A. 157. "*Mep* simply meant something unpleasant, a sort of generic meaning."

A. 190. (Note) "In this case it is obvious that the stimulus words have been classified as nice, moderate, nasty, etc. *Vab* was confused with *Zul* and here had only the meaning 'one of the nasty ones.'"

A. 190. "The pairs of alternatives do not mean what is in the glass, but mean the abstract value, often less precise in his connotation than the actual liquid."

C. 28. "Read *Zul-Ziv*. Knowledge they were the two extremes in the scale of value."

C. 54. "Read *Zul-Ziv*: seemed some verbal imagery 'unpleasant,' 'pleasant.'"

[1] *Vab* = "Bic" (Bi-Carb), *Laip* = "Milk,"
Mep = "Salt," *Tauk* = "Orange,"
Zul = "Salicylate," *Ziv* = "Sweet,"
Jor = "Alcohol," *Klum* = "Acid."

C. 74. "Their meanings developed fairly rapidly. The one as 'neutral' and the other as 'very pleasant.'"

D. 110. "No memory of *Ziv* as such, except that it was 'very pleasing.'"

D. 109. "Recognised *Laip* as something more pleasing."

Thus *Tauk*, instead of being "sweet," "orange-tasting," "smooth," "piquant" becomes evaluated merely as "good," "pleasant," "a thing to take." *Mep* is no longer re-instated in its "salty" nauseating character, but was "bad," "a thing to avoid." *Ziv* and *Zul* for example, when presented together, were not re-instated as the two individual tastes, but as the "two extremes," "two ends of the scale," the "best and worst," "wide apart in value." The two or three tastes in the middle of the scale appeared to lose their individual character altogether, and to be classed as "indifferent."

(3) *The Names of the Alternatives Function as Language Words.*

At this stage meaning did not develop explicitly after a reading of the syllables, but was given immediately as is the meaning of ordinary language words. In such cases meaning was an item of knowledge; imagery seldom accompanied it. Meaning and value were quite clear, and adequately presented for the subsequent Motivation, but they were given as part of the Percept of the Stimulus words, and were not separable from it[1]. E.g.:

A. 25. "The meanings came up with the words."

A. 96. "*Tauk* meant itself. *Mep* meant itself."

A. 76. "These words are now like ordinary language words."

E. 21. "Perception and appreciation of syllables now simultaneous with the fall of the shutter."

A. 100. "Auditorily, and kinaesthetically, '*Mep-Klum.*' Knowledge of their meanings, but not separable from the words."

B. 10. "*Jor-Tauk* seen, and both at once carried its meaning."

It is not claimed that these stages always follow one another exactly in this order, or that they are indicated with equal clearness in the reports of all our subjects. But what is clear is the fact that the principle of economy is at work among the processes constituting appreciation of the alternatives[2]. All our subjects finally reached a stage in the course of the experiments at which many factors originally in the percept tended to be suppressed, only such characters being revived as were necessary for motivation of the choice. It is

[1] If, for example, I say the word *Tauk* to any of my late subjects, it would carry as clear a conceptual meaning as would the word "book," "gold" or "house." If however I were to repeat this procedure in 20 years' time it is probable that I should find the word once more separated from its meaning.

[2] We shall show in the next chapter that the same principle is at work among the processes constituting Motivation.

clear that this is due to a functioning of the determining tendency created by the acceptance of the Instruction,—"Choose for a serious reason, *but react as quickly as possible.*" This point will be discussed again when we deal with our data on Motivation. It will be sufficient here to summarise briefly the chief ways in which these "short cuts" in the appreciation of the alternatives were achieved.

(1) *Meaning does not develop fully.* We have already shown that the alternatives quickly came to be classed as "good," "bad," "indifferent," etc., and that there was a tendency on the part of the subject to accept these meanings as sufficient for deliberation. Where such meanings and values were too indefinite to give rise to adequate motives, the subject felt under an obligation to make the meaning concrete and individual. For example, one subject (E) reported "Knew Tauk was good, but felt I ought to get it clearer." Usually, however, they were accepted as sufficient for deliberation, and the choice took its normal course.

Again, our subjects commonly reported that only one alternative developed a clear meaning, the other remaining only indefinite. This was particularly the case when one of the pair was the alternative placed at the top or bottom of the hedonic scale. E.g.:

A. 57. "*Tauk*, auditorily with clear knowledge I liked it. *Jor* simply the 'other one,' not pleasant."

C. 47. "Gave a marginal glance at the other. Recognised *Klum*. Without waiting for its full value to develop turned to the other, and chose it."

B. 43. "I was not aware of the intrinsic value of *Klum*, but only that it was better than *Zul*."

F. 32. "*Mep*, *Vab* read. *Vab* became 'Bicarb,' with awareness that it was better than other one. The term 'other one' shows the indefiniteness that had come over *Mep*."

F. 38. "No meaning of *Zul*, except that it was there again. Not very clear, though it certainly carried a signature 'not wanted.'"

D. 105. "I recognised *Zul*, being repelled, shrinking away. Made my choice for the 'other' without knowing what it was, but knowing dimly that it was not as bad as *Zul*."

C. 7. "Immediate awareness of *Ziv*. Attention riveted on it. I seemed to be drawn to such an extent I could not give any serious consideration to *Jor* at all."

C. 98. "Became aware of the unpleasantness of *Zul*; no definite meaning to *Jor* except that it was neutral."

A. 145. "Meaning *Ziv* dominated *Tauk*. *Tauk* practically no meaning at all. *Ziv* was the only meaning. *Tauk* in the background dominated by *Ziv*."

We may note in passing that the wording of these reports indicates that the subject is conscious of his own activity during the process of perceiving. This seems particularly noticeable in the belief he has in his own control of the development of meaning. He accepts an imperfectly developed meaning with a belief that he is capable of making it more explicit if necessary; he is aware of exerting or witholding his activity with regard to such development.

(2) *A knowledge of previous reactions and of alternatives previously chosen is immediately evoked by the percept.* As this point will come up again when we discuss Motivation and its ultimate simplification under the influence of repetition, we here need only indicate the kind of evidence from our reports which supports this statement.

B. 7. "Immediately recognised I had had this pair before this morning, and was aware in an intentional way of the content of the previous reaction."

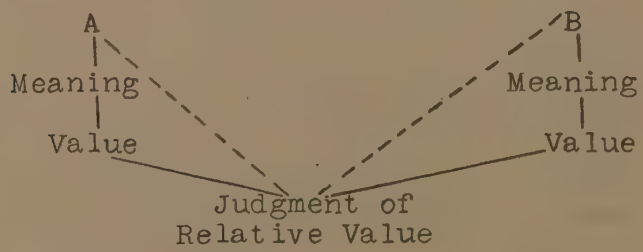
C. 100. "Read *Tauk-Zul.* Remembered I had had these alternatives once before. Also aware of the one I had chosen."

C. 113. "Read *Tauk-Ziv*; had a knowledge that I usually chose *Ziv* in such cases."

A. 34. "Intentional memory of the last reaction."

A. 45. "There was a feeling of familiarity, a knowledge that I had had before this afternoon a reaction to *Klum-Laip.* Further knowledge, and a feeling of ease."

(3) *Relative value is given immediately as part of the percept of the stimulus words.* In the earlier experiments of the whole series it was usual for the meanings of the two alternatives to be held separately in consciousness and for a judgment expressing the relation between the two values to be formulated. With repetition these processes showed considerable simplification, until a stage was reached at which the two names were sufficient to put the subject immediately in the presence of the relative value of the two. The simplification of the processes following upon the reading of the alternatives may be illustrated diagrammatically:



Relative value comes finally to be given immediately the alternatives A and B are read, the intermediary processes by which it was reached being suppressed. E.g.:

A. 37. "An immediate knowledge of relative value."

A. 53. "On seeing the stimuli I had an immediate knowledge of relative value."

E. 28. "After seeing syllables, I knew at once which I preferred."

A. 21. "*Laip-Jor* with their relative hedonic value."

A. 95. "Saw stimuli which had relative hedonic value."

C. 33. "Saw *Laip-Vab*. Was aware that they were wide apart in value."

C. 107 (and 116). "Read *Zul-Ziv*, was aware of their relative value. Had knowledge that they were two extremes."

(4) *Spatial and visual schemes tend to develop.* Although this point is of interest in the development of meaning it seems to be of no special importance in the development of volitional consciousness. We shall therefore only make slight reference to it. Some subjects clearly expressed the fact that the alternatives had been arranged spatially in a visual scheme, and that the given alternatives had to be fitted into this scheme before Motivation could proceed. E.g.:

E. 21. "When shutter fell, read *Mep-Jor*; verbal imagery—'*Mep* is salt.' Slightly gustatory too. Then *Jor* repeated. Could not get a gustatory image for *Jor*. Failed also to find a word (describing it). Feeling I ought to know it; a definite search. Slight displeasure. Tried to fit 'pleasant' or 'unpleasant' to it. Neither seemed to fit; while *Mep* seemed to fit on the left-hand side of a dividing line. A feeling that all things on that side were unpleasant, though what was also there was not known. Failed still to fit *Jor* into this scheme, but know it was not so nasty as *Mep*. Took it."

Others made vaguer reference to some sort of positional imagery at the revival of meaning, but did not make more explicit reference to a scheme. E.g.:

A. 280. "Meaning...its place in the set."

F. 114. "In middle doubtful zone."

One subject had a well-developed scheme of mental direction expressing the main classes of alternatives, good, bad and indifferent. These mental directions were accompanied by kinaesthetic images of movement to N.E., N., and N.W.

From the analysis of the act of choice up to this point we see that normally, immediately the stimulus is perceived, the values which are immediately evoked by the percept of the stimulus words, or which emerge as meaning revives, give rise to motives, and all the processes entering into the total act of choice develop smoothly. If

for any reason meaning fails to arise, there is a state of waiting and confusion, and often a volitional effort to hold up the reaction until motives do emerge. It will be interesting to enquire into the conditions producing this inhibition.

Effects of Bad Adaptation.

The adaptation of the subject to the conditions of the experiment has an important influence on Perception of the Stimulus. Bad adaptation, just before or at the moment of the appearance of the alternatives, has a marked effect on the development of the subsequent processes. Cases of bad adaptation were quite frequent with all our subjects[1] and in their reports the following characteristic effects of it are to be found:

(1) *The Instruction reappears.* Normally the instruction is present only intentionally at the appearance of the stimulus. The determining tendency created by the acceptance of the task guides the processes which gradually unfold during the experiment, and the subject is not explicitly conscious of the instruction which has been given[2]. If his adaptation is bad, however, the determining tendency fails to function in its usual manner; there is an arrest in the development of the processes, a feeling of waiting, and a reappearance of the words of the instruction, wholly or in part: "Choose one of the glasses, for a serious motive, and react as quickly as possible. Drink from the one you have chosen." E.g.:

A. 185. "*Mep-Vab* repeated several times with eye movements. Could not see well. Feeling of annoyance. Then eyes rested on *Vab*. Eye movement ceased. There was a certain amount of muscular strain. Knew both were unpleasant, but that *Vab* was less so than *Mep*. Knew reaction was taking a very long time, but that I must react for good reasons. Gradually *Vab* imposed itself on me."

E. 7. "Saw stimuli. To-day felt I preferred *Klum* to *Jor*. Something seemed to say, 'Stop and think which is best. Choose for a good reason; a feeling; no words present. No reason came. Found I was saying rapidly, 'I must hurry up and choose.' Tension and annoyance increased. Seemed to reach

[1] The cause of bad adaptation may be either:

(*a*) Objective. E.g.: Bad lighting (A. 55), bad print on stimulus card (C. 1, D. 32), faulty position of card or of words (C. 31), failure in appearance of the warning signal (A. 79).

(*b*) Subjective. E.g.: Distraction of attention from the experiment by a sudden noise or by other objects of thought (B. 43), coincidence of the appearance of the stimulus with a low ebb of attention (A. 188, E. 22, F. 74).

[2] Michotte and Prüm enumerated the different forms under which the instruction may be present at the perception of the stimulus (*Le choix volontaire*, p. 147); we have nothing to add to their analysis of this point.

breaking point. Eye happened to fall on *Klum*: found I was taking it. Feeling of relief and satisfaction followed immediately I had started to move hand."

Michotte and Prüm have already called attention to this fact in the case of the subjects who served for their research. Our protocols corroborate the conclusion at which they arrived, and in addition our objective records, both reaction time and psycho-galvanometric deflection, show characteristic changes which correlate with the reports of bad adaptation, and reappearance of instruction. The accompanying Table gives the results of our investigation on this point.

To compile Table VIII, all the introspective reports (about 900) were examined with a view to making a record of experiments where bad adaptation occurred.

Table VIII. Effect of bad adaptation.

	1	2	3	4	5	6	7	8	9
Subject	Proportion of cases of bad adaptation	Proportion of B. Ad. cases in which instruction reappeared	Proportion of B. Ad. cases resulting in bad choice	Av. % fall in resistance in B. Ad. cases	Av. % fall, all choices: crude Av.	Variation: Av. % fall: B. Ad. from crude Av.	Av. R. T. in B. Ad. cases	Av. R. T. All choices: crude Av.	Variation: Av. % R. T. B. Ad. from crude Av. R. T.
A.	10·7	18·1	21·2	4·0	2·75	+45·4	1611	1653	− 2·5
B.	17·6	53·0	27·0	5·2	4·03	+29·0	3925	4022	− 2·1
C.	10·2	41·6	8·3	12·0	6·38	+88·0	3711	3071	+20·8
E.	24·0	41·0	50·0	6·6	6·34	+ 4·1	3313	2945	+12·7

The relative frequency with which these cases occurred in the total series of experiments was then calculated for each subject, and is indicated by the percentage in column 1. The proportion of cases of bad adaptation in which the instruction reappeared is given in the percentages in column 2. Column 4 gives the average percentage fall in electrical resistance for cases of bad adaptation, and column 6 the percentage variation of this average from the crude average for all choices. Column 9 gives a similar variation between the reaction times in columns 7 and 8.

These figures reveal the following facts:

(*a*) There is a relation between bad adaptation and reappearance of instruction.

(*b*) The percentage fall in resistance in cases of bad adaptation is considerably higher than the crude average. In the light of the theory we advanced (ch. IV) in respect of the relation between the appearance of the reflex and conative effort in the choice, we should expect to find this result. The subject's

conative effort to hold up the reaction until the processes of perception, evaluation and motivation have been established, and the state of striving which this arrest produces, would be accompanied by a fall in resistance greater than the average.

(*c*) The reaction time is longer in cases of bad adaptation. This fact, in itself, is of no particular interest or significance, for we should naturally expect this to be the case owing to the interpolation of processes not usually present.

(2) *Strain, Tension, Changes in Breathing and Sense of Effort are reported.* When the subject is badly adapted at the appearance of the stimulus in the earlier instances he reports his experience globally as a feeling of strain and effort. In later experiments he is often able to analyse this experience into two distinct contents:

(*a*) *Awareness of muscular strain* in eyes, head, face, neck, etc., due to efforts to see better; of movements of the limbs to the usual reaction position; of changes in breathing. The respiration curves obtained often provide objective confirmation of these reports.

(*b*) *Awareness of self-activity* accompanying his rapid and vigorous direction of intention to the stimulus which he has not yet fully cognised. This awareness of self-activity was reported in the term "consciousness of action" and the experience seems similar in all respects to the experience of self-activity at the moment of designation.

(3) *Unpleasure, Annoyance, Bewilderment, Astonishment, Feeling of Impotence and other affectively toned contents tend to develop.* The reports make it clear that these affective tones develop as a result of impeded striving, and occur because the normal functioning of the determining tendency has received a check owing to the subject being badly adapted. E.g.:

A. 36. "Did not see very well; also momentary annoyance at noise of people in corridor. Then *Ziv-Tauk* repeated with knowledge of relative hedonic values. No motive to choose either." (46) "*Vab-Mep*, auditorily and kinaesthetically quite a number of times. Feeling of helplessness; my head trembled; clear sensations, not images. Strong feeling of dislike and impotence. Knowledge the whole thing was going slowly and badly." (51) "Was bewildered, and for a very long time sat and contemplated them. Sense of helplessness and effort."

C. 1. "When shutter fell, experienced surprise that letters were so small. Thought I should not be able to see without straining myself." (C. 9) "Read *Vab-Zul* with feeling of surprise. Gave place to a feeling of perplexity and helplessness."

(4) *Meaning of Syllables fails to develop, or develops imperfectly.* In such cases the subjects reported either that the syllables were quite unfamiliar and meaningless, or more commonly, that they were familiar but meaningless. Here the only meaning attaching to the alternatives is a recognition of them as words used in connexion with

the experiments. A state of confusion follows, in which it is common for the subject to repeat the stimulus words helplessly—sometimes even aloud—several times. E.g.:

A. 4. "The two words seemed familiar, but there was no particle of meaning to either." (78) "At appearance of stimulus there was a little inhibition. Words familiar, but had no meaning; then again *Laip-Tauk* auditorily and kinaesthetically. Sort of groping for a meaning." (80) "Feeling of puzzlement that words had lost their meaning." (69) "Had very little meaning. Even unfamiliar."

D. 20. "Mind not working well. Words meant nothing." (41) "Very sluggish to-day. Had to make an effort to recall tastes. Did not succeed very well."

When in such cases a meaning does finally develop, it is common for it to be incomplete, or even incorrect. Thus the motives which emerge from the values given in this meaning are either inadequate, leading to "bad," hasty, or hesitating choice[1], or out of harmony with the true value of the alternative, leading to a choice which the subject regrets when the time comes for its realisation. The percentage number of cases in which bad adaptation led to choices of this kind is given in column 3 of Table VIII.

An interesting case of incomplete revival of meaning is to be seen when one of the pair of alternatives remains meaningless until the subject is on the point of ending the reaction by taking the other. At this moment it is common for the meaningless syllable to develop a "brilliant" meaning, thus introducing fresh motives, and changing the whole aspect of deliberation. E.g.:

A. 85. "*Tauk*, auditorily with knowledge of meaning quite clear. Then *Ziv* very faintly present as stimulus and meaning. *Tauk* accepted as being the more pleasant. At the moment of reaction *Ziv* pushed into consciousness as the most pleasant of the lot. Quick change of direction of attention and I actually drank *Ziv*. The change at the end from *Tauk* to *Ziv* was characterised by what I might call great brilliance in the meaning of *Ziv*, and a knowledge I had chosen the less pleasant. This quick swing at moment of reaction was characterised by consciousness of action."

A. 103. "Meaning of *Jor* was confused; meant something rather nice. *Tauk* had little meaning, and there was the beginning of an intentional direction to *Jor*. Suddenly *Tauk* developed quite a brilliant meaning; something extremely nice. Quick swing away from *Jor* to *Tauk* which was designated with consciousness of action and pleasure. I, so to speak, stopped myself in the middle of choosing *Jor* and switched to *Tauk*."

In this paragraph we have only attempted to trace the effect of bad adaptation on the processes entering into perception of the

[1] "Bad" is the subject's own term, and indicates a choice which he feels has been made after incomplete deliberation.

alternatives; but we could also show that it has marked effects on the subsequent development of motivation.

Much of what has been said with regard to the processes appearing at this stage of choice has necessarily already involved considerable reference to motivation: for as we pointed out at the beginning of the chapter, the nature of our technique made the division between "perception" and "motivation" largely an artificial one. We shall now turn to a detailed consideration of the processes involved in evaluation of the alternatives, and discussion of motives.

(3) EVALUATION OF THE ALTERNATIVES, AND DEVELOPMENT OF MOTIVES.

Before discussing the processes entering into this phase of the choice, it will be necessary to define our position with regard to the much-debated question of the exact psychological constitution of value or worth.

Value can be found exclusively as an attribute of neither subject nor object, but rather in a functional relation between the two; all values are, therefore, descriptions of such relations, actual or possible. That is to say, value cannot be deduced from the qualities of the object nor from a knowledge of the needs of the subject; it only appears as a content of consciousness when these two come into relation.

In experiments of the nature of those carried out in this research it is essential for the experimenter to have more or less accurate knowledge of the value of the alternatives presented. The alternatives entering into the choices must permit of arrangement into a scale before we can examine such questions as the evolution of motives, the influence of value on the discussion of motives, modification of value by means of the alternative to which it is opposed (relativity), influence of value on the duration, complexity, and structure of choice. It might be possible, of course, to construct an *a posteriori* scale of values based on analysis of the vast mass of material provided by values in everyday life. On the other hand we have the alternative course of creating an *a priori* scale of new values. Michotte first suggested the method of obtaining a completely new and objectively determined scale of values in the sensory experience resulting from the tasting of different specially prepared substances. It was found possible to invent prescriptions for preparing liquid tastes of very varying hedonic values, but all entirely different from the tastes of everyday life. Such a system of new tastes, arranged in a well-

differentiated, well-defined scale, was first used by Boyd Barrett under the direction of Michotte, as alternatives in his investigation of choice processes[1]; and the results to which this technique led proved the applicability of the method[2].

We adopted this method in our research and used the series of tastes employed by Boyd Barrett, altering some of the names which already had associations for our subjects. In describing our method (ch. II) we noted that the order of the tastes given during the Learning Period was changed daily. In this way the effect of contrast and comparison between contiguous tastes was eliminated. When at the end of the preliminary tasting experiments each subject was required to write down the tastes in the order of value as he estimated them, it was felt that the experimenter was in possession of a scale of values as stable and objective as it is possible for any values to be. It is not claimed for this method that the experimenter can measure exactly the different degrees of value experienced by the subject; but each subject can undoubtedly state the position of each alternative in the scale, and can indicate, in an approximate manner, the relative distance which separates the different members of the scale. But this does not take us very far, for it is clear that any given grading of the tastes only holds good for the individual subject who made the estimate. Thus it would seem that we are in no way entitled to compare the motivation of one subject with that of another, for it is impossible to obtain any absolute measure of the degree of value in the various grades of the scales of different subjects; we cannot for example assume that the degree of value evoked by the taste placed at the top of the list by one subject is equal to that evoked by the taste placed first by another.

This difficulty with regard to the establishment of an intra-individual scale of values was indicated by Michotte who pointed out that, although it is impossible to establish any correspondence between impressions of absolute value from one subject to another, it is nevertheless possible to create conditions for choice which are relatively similar for different subjects[3]. We noted that each subject was able to place his tastes in a value-order and to indicate approximately the distance separating the members in the series. Thus, while the original grading of the tastes depends on an individual

[1] Boyd Barrett, *Motive Force and Motivation Tracks.*

[2] Michotte, *Note à propos de Contributions Récentes à la Psychologie de la Volonté*, p. 197.

[3] *Contributions Récentes à la Psychologie de la Volonté*, p. 196: "Il nous est impossible de savoir si le désagrément provoqué chez tel sujet par telle substance est plus ou moins grand que le désagrément provoqué par la même substance chez un autre sujet."

subjective estimate varying from subject to subject, it appears to be possible to present to two different subjects, alternatives which will place each in the presence of a similar relation between values[1]. We are justified in claiming that subject A. confronted with tastes (1) and (8) from his own scale, and subject B. with alternatives in the same place-value, are in the presence of a similar relative value, and that conditions for motivation will be similar, at least objectively.

We will now turn to the results of our experiments, from which we can show: (1) That the *a priori* scale of values formed by each subject during the preliminary experiments had a real influence on the motivation and selection; (2) That the theory of an intra-individual scale of relative values is valid.

(1) *The Influence of the Original Evaluation of the Alternatives on the Result of the Choice.*

It is interesting to compare the *a priori* scale of values for each subject with those it is possible to construct *a posteriori* from the relative frequency with which each of the different alternatives was actually chosen; for, although we have to recognise that extraneous values may and do develop around a given alternative during the process of choice itself, we may reasonably expect the original value of the alternatives to be the predominant influence in the resulting selection. To compile the tables we now present, we classified our results according to the following scheme:

Subject	No. of Exp.	Alternatives	No. of presentation	Alternative chosen	% fall in resistance	Reaction times
A.	25	Jor-Vab	1st	Jor	1·4	1456
	62		2nd	Jor	1·5	2000
	129		3rd	Jor	1·5	1868
	196		4th	Jor	6·1	1335
	211		5th	Jor	·9	1054
	30	Vab-Jor	1st	Jor	1·5	1868
	83		2nd	Jor	6·1	1335
	137		3rd	Jor	4·0	1406
	214		4th	Jor	2·1	705
		Jor-Mep Mep-Jor	etc.	etc.	etc.	etc.
		Jor-Klum Klum-Jor etc.	etc.	etc.	etc.	etc.

[1] *Contributions Récentes à la Psychologie de la Volonté*, p. 197: "Il en résulte que des rapports de valeurs jugés de façon semblable par différents sujets, devront être considérés comme identiques en realité....Sans vouloir prétendre, qu'ils soient équidistants chez différents individus, on doit admettre qu'il est possible, en les présentant aux sujets, de mettre ceux-ci dans des conditions rélativement semblables."

Thus, from this classification of results it was an easy matter to isolate all the choices into which a given alternative entered, irrespective of the other with which it was combined.

Table IX gives the results compiled from this classification, for all our subjects, and reveals the extent to which the original evaluation influenced the final selection. Column 1 gives the *a priori* scale of values as they were estimated by each subject, beginning with the most agreeable and ending with the most disagreeable. Column 2 gives the number of times each alternative was presented irrespective of the other alternative with which it was combined in the experiment. Column 3 shows the number of times each alternative was chosen, and column 4 gives this as a percentage. The numbers in column 4 are, therefore, roughly comparable.

Table X is a summary of Table IX, columns 1 to 4, and shows at a glance the degree of correspondence between the *a priori* scale of values and the *a posteriori* scale based on the percentage results of the choices. It will be seen from these tables that the original evaluation influences the resulting choice in a marked manner. With comparatively few exceptions the two scales correspond; and where such exceptions occur they can usually be accounted for by some change in the value-estimate occurring during the experiments and reported in the introspection. One example of the influence of such a change in value will illustrate this. With subject B. it will be seen that *Tauk* was placed highest on the list and yet was only chosen 80 per cent. times, while *Ziv*, the next in value, was chosen 92·8 per cent. times. This apparent exception in the influence of the original value-scale on the resulting choice can be distinctly traced to a modification, owing to extraneous circumstances, of the original estimate of the value of *Tauk* during the course of the experiments[1].

We next determined the average reaction time and the average percentage fall in resistance for all choices in which each of the alternatives was preferred, the selection of cases being made from the classification of data in the tables of which we showed a specimen on p. 64. These results are given in columns 5 and 6 of Table IX. It will be seen that although there is some indication that the reaction time varies inversely with the degree of value, not one of our six subjects exhibits this tendency with any marked degree of consistency.

[1] On looking at the bottles in the experimenter's room, subject B. noticed that a mould was beginning to form on the liquid in the bottle. She failed to report this before sitting for the day's experiments, and the changed evaluation of *Tauk* is clearly indicated in the results of Table X and reported in the introspections.

Table IX. The influence of original evaluation of the alternatives on the result of choice.

	1	2	3	4	5	6
Subject	Estimated order	Times presented	Times chosen	% choices	Av. R.T.	Av. % fall
A.	Ziv	52	49	94·1	1199	2·3
	Tauk	47	38	80·8	1079	2·7
	Jor	64	33	51·5	1376	4·4
	Klum	45	35	77·7	1465	2·9
	Laip	54	26	48·1	1213	2·4
	Mep	65	14	21·6	2327	3·5
	Vab	54	10	18·5	2005	3·6
	Zul	62	16	25·8	3219	2·7
B.	Tauk	15	12	80·0	3422	3·8
	Ziv	14	13	92·8	3381	4·82
	Klum	17	13	76·5	2936	2·7
	Mep	20	8	40·0	4496	3·8
	Jor	16	8	50·0	4951	4·2
	Laip	17	4	23·5	6192	4·68
	Vab	19	8	42·1	3446	7·13
	Zul	18	1	5·5	—	2·6
C.	Ziv	24	23	95·8	2495	5·45
	Tauk	26	23	88·5	2122	5·76
	Laip	27	21	77·7	2506	6·89
	Klum	28	15	53·5	2909	5·41
	Jor	26	14	53·8	2606	7·7
	Mep	26	5	19·2	3998	4·4
	Zul	25	3	12·0	6134	4·82
	Vab	30	3	10·0	5982	7·0
D.	Ziv	28	27	96·4	1334	1·17
	Tauk	28	23	82·1	1566	1·17
	Mep	29	15	51·7	1671	3·32
	Laip	29	17	58·6	1424	1·1
	Jor	32	21	65·6	1356	0·57
	Klum	24	7	29·1	1093	0·7
	Vab	28	4	14·3	2443	2·8
	Zul	30	0	0	1243	—
E.	Ziv	9	8	88·8	3520	11·9
	Tauk	10	8	80·0	2451	8·3
	Laip	9	8	88·8	2756	5·4
	Zul	12	6	50·0	1882	8·9
	Klum	10	6	60·0	4082	2·6
	Mep	14	4	28·5	4136	9·0
	Jor	11	6	53·7	3131	7·7
	Vab	12	1	8·3	2360	6·0
F.	Ziv	20	20	100·0	2869	3·1
	Tauk	21	18	85·7	2280	4·4
	Laip	19	12	63·1	2607	3·7
	Vab	22	15	68·2	2336	3·3
	Jor	22	9	40·9	2561	3·5
	Klum	24	11	45·8	2087	2·8
	Zul	23	2	8·7	1589	9·0
	Mep	27	2	7·4	6384	3·1

Boyd Barrett quoted results obtained from one only of his subjects[1], and from them deduced the following conclusion:

"We found that a correlation existed between the quickness of the reaction and the hedonic value, or motive force of the alternative chosen. This enabled us to formulate a principle of considerable importance, holding, of course, only for choices made under conditions such as those of our experiments; viz. *That the quickness of the choice-act is in direct relation to the motive force of the alternative chosen.* This principle enabled us to approach the problem of the measurement of motive force with considerable confidence[2]."

Table X. Showing the extent to which the original evaluation has influenced the selection.

Subject	*A priori* scale	*A posteriori* scale	Subject	*A priori* scale	*A posteriori* scale
A.	Ziv	Ziv	D.	Ziv	Ziv
	Tauk	Tauk		Tauk	Tauk
	Jor	Klum		Mep	Jor
	Klum	Jor		Laip	Laip
	Laip	Laip		Lor	Mep
	Mep	Zul		Klum	Klum
	Vab	Mep		Vab	Vab
	Zul	Vab		Zul	Zul
B.	Tauk	Ziv	E.	Ziv	Ziv
	Ziv	Tauk		Tauk	Laip
	Klum	Klum		Laip	Tauk
	Mep	Jor		Zul	Klum
	Jor	Mep		Klum	Jor
	Laip	Vab		Mep	Zul
	Vab	Laip		Jor	Mep
	Zul	Zul		Vab	Vab
C.	Ziv	Ziv	F.	Ziv	Ziv
	Tauk	Tauk		Tauk	Tauk
	Laip	Laip		Laip	Vab
	Klum	Klum		Vab	Laip
	Jor	Jor		Jor	Klum
	Mep	Mep		Klum	Jor
	Zul	Zul		Zul	Mep
	Vab	Vab		Mep	Zul

We are not, from the results at our disposal, able to corroborate this conclusion; nor are we able to agree with Boyd Barrett in claiming that a scale such as the one quoted provides us with a scale of

[1] This is the table given in *Motive Force and Motivation Tracks*, p. 96:

Original scale of values	K	T	Z	V	J	B	C	L
Percentage choice	91·7	82·1	81·1	56·3	39·2	38·1	13·3	3·5
Mean R.T.	761	803	909	970	827	991	1300	—

[2] *Motive Force and Motivation Tracks*, p. 95.

motive forces which will aid us in the determination of the strength of any particular motive we may need to examine. We agree that the quickness of the choice-act is in direct relation to the *motive force* of the alternative chosen; but we shall produce evidence to show (pp. 84 to 91) that the *motive force* of a given alternative depends on further factors than its original *hedonic value* alone. We should not therefore expect to find the remarkable correspondence between the original value-scale and the reaction times, as is shown in the results quoted from Boyd Barrett's subject.

Again, there is no indication of an order in the average percentage falls in resistance given in column 6 of Table IX. At first sight, on our theory of the relation between conative effort in the choice and the amount of fall in resistance, this may seem a little surprising; and we might expect the percentage falls in resistance to increase as the value of the alternative decreases; i.e. we should expect them to vary inversely with the value, more conative effort being required to choose an alternative of low than one of high hedonic value. There is, however, no indication of this tendency in the figures given in Table IX, and as a result of the evidence as it stands here we have to conclude that the degree of value of the alternative *as such* does not influence the fall in resistance. In our opinion the hedonic quality of the alternative can only influence the fall in resistance by influencing the amount of conative effort in the choice; it can only influence the amount of conative effort by its influence on motivation; and motivation develops, not as a result of the absolute value of the alternative, but out of the relation between the values of the two alternatives[1]. That is to say, relative value is the factor determining the amount of conative effort in the choice, and through this—and such physiological processes as may be interpolated between it and the psycho-galvanic deflection—the amount of fall in resistance. Absolute values, therefore, influence the type of choice only indirectly through the degree of relative value they produce when placed one against the other as alternatives for choice. We must then look rather for signs of order among the data we have regarding relative value, than in that given in Table IX. This brings us to the second

[1] The fact that the two alternatives in the choice are relative needs no discussion. Boyd Barrett, *Motive Force and Motivation Tracks*, p. 194, summarising the evidence for the functioning of Psychical Relativity in choice processes, states that the alternatives in a choice process are trebly relative:

1. "Inasmuch as they are present in, and are actual parts of a system or synthesis."
2. "Inasmuch as they modify each other directly, owing to contrasts."
3. "Inasmuch as they are subject to the effects of the forward movement of the conative process of choosing."

point in our discussion, the validity of the theory of an intra-individual scale of relative values.

(2) *The Influence of Relative Value on the Result of the Choice.*

We stated earlier that by combining alternatives of similar place value from the original scales made by different subjects it was found possible to plan choices in which the relative value was approximately of the same degree for each subject, although as we have seen, the absolute value of the alternative does not admit of comparison from one subject to another. If this theory is sound we may reasonably expect confirmation of it in the shape of some sort of orderly progression in the numerical results of the objective records. From a purely theoretical point of view we should expect that the more distant the relation between the two alternatives, as for example between those in the first and last places in the scales, the easier and quicker the choice; and, other factors remaining equal, the lower the fall in resistance and the shorter the reaction time. On the other hand, the closer the relation the more difficult and lengthy the choice, the greater the fall in resistance, and the longer the reaction time. If we have really created a scale of relative values comparable from subject to subject, we shall expect the same general tendency to appear in the objective records of all subjects.

In order to reveal any general tendency towards an order in the reaction times and percentage falls in resistance, we made use of a scheme of classification of which the following is a specimen:

	1	2	3	4	5	6
Subject	Alternative	Combination	Times chosen	% times chosen	Av. R.T.	Av. % fall
A.	Ziv	Z.T.	6–8	75	1532	2·2
		Z.J.	8–9	88·8	1112	1·76
		Z.K.	5–5	100	1219	2·0
		Z.L.	8–8	100	1249	2·8
		Z.M.	6–6	100	958	1·6
		Z.V.	9–9	100	1290	2·65
		Z.Zu.	7–7	100	1029	3·2
	etc.	etc.	etc.	etc.	etc.	etc.

Column 1 shows the alternative, and column 2 this alternative in all its possible combinations. Column 3 gives the number of times the alternative in column 1 was chosen, and column 4 this number expressed as a percentage. Column 5 gives the average reaction time, and column 6 the average percentage fall in resistance for all cases of choice in which the given combination was presented.

These tables, however, give us no direct information as regards the influence of relative value on the magnitude of reaction time and percentage fall in resistance; for it will be remembered that the hedonic scales varied from one subject to another. But by reference to these scales (see Table IX, column 1) it was found possible to select, from the data presented in the summaries, suitable combinations expressing the following relative values for each subject:

Pleasant-Pleasant	Pleasant-Unpleasant
Indifferent-Indifferent	Pleasant-Indifferent
Unpleasant-Unpleasant	Indifferent-Unpleasant.

Table XI gives the classification of data—average reaction times, and average percentage fall in resistance—for these typical cases of relative value. The results in columns 2 and 3 have been obtained by taking the average of all possible instances of the given type of relative value. For example, in the case of the first subject, alternatives from the following places in the scale of values were selected:

P.P. 1 with 2.
I.I. All combinations of 3, 4, 5.
U.U. All combinations of 6, 7, 8.
P.U. All combinations of 1 and 2 with 7 and 8.
P.I. All combinations of 1 and 2 with 3, 4 and 5.
I.U. All combinations of 3, 4, 5 with 6, 7 and 8.

Thus the results in columns 2 and 3 of Table XI indicate variations in the magnitude of the average reaction time and average percentage fall in resistance, with different types of relative value.

Examination of these results in columns 2 and 3 shows that the following tendencies seem to be indicated in all subjects:

(1) In cases of equal value (P.P., I.I., U.U.) where the relation between the alternatives is one of "likeness," there is clear indication in all subjects that the reaction time is longer.

(2) In cases of equal value there appears to be some tendency for the average percentage fall in resistance to be greater.

(3) In cases of choice where the relation between the values of the alternatives is one of "unlikeness" (P.U., P.I., I.U.), there is an indication that the reaction time tends to be shorter and the average percentage fall in resistance less than in cases of equal value.

(4) In the most extreme example of "unlikeness"—P.U.—the reaction time is clearly the shortest.

It was felt that these indications might be made clearer if, instead of including all possible instances of the type of relative value under consideration, only the extreme cases were counted in the calculation of the average for that type. This would tend to sharpen any variation proper to the different types. Thus, instead of using all

Table XI. Showing comparison between average reaction time and average percentage fall in resistance for different types of relative value.

	1	2	3	4	5	6	7	8	9
Subject	Relation	All instances of given relation		Extreme instances of given relation		Grouped: "Likeness," P.P.; I.I.; U.U. "Unlikeness," P.U.; P.I.; I.U.		% differences in "likeness" and "unlikeness" groups	
		Av. R.T.	Av. % fall	Av. R.T.	Av. % fall	Av. R.T.	Av. % fall	Av. R.T.	Av. % falls
A.	P.P.	1566	2·8	1566	2·8				
	I.I.	1503	2·84	1419	4·18	1897	3·76	66·1 increase "likeness" over "unlikeness"	69·3 increase "likeness" over "unlikeness"
	U.U.	3408	3·17	2706	4·29				
	P.U.	1090	2·88	1124	2·12				
	P.I.	1281	2·5	1239	2·16	1142	2·22		
	I.U.	2128	2·2	1064	2·4				
B.	P.P.	4972	4·2	4972	4·2				
	I.I.	4083	2·4	4248	4·9	4508	4·48		
	U.U.	4992	4·27	4306	4·27				
	P.U.	3020	3·72	3890	3·9			25·3 increase	16·9 increase
	P.I.	3679	4·17	3538	3·5	3597	3·83		
	I.U.	3842	4·4	3364	4·1				
C.	P.P.	3015	5·6	3015	5·6				
	I.I.	3272	11·23	3886	12·45	4448	7·19		
	U.U.	4755	4·72	6892	3·51				
	P.U.	2291	10·4	2041	6·55			87·9 increase	42·3 increase
	P.I.	2319	4·53	2349	3·48	2366	5·05		
	I.U.	3443	5·67	2710	5·12				
F.	P.P.	4914	1·5	4914	1·5				
	I.I.	2520	2·71	1765	2·4	4354	*2·33		
	U.U.	3794	5·2	6384	3·1				
	P.U.	1798	4·19	1725	3·03			76·0 increase	27·6 decrease
	P.I.	2599	3·57	2447	3·22	2473	3·22		
	I.U.	3009	3·5	3249	3·4				

* Individual difference.

combinations of values 3, 4, 5 in the classification of the Indifferent-Indifferent type, only values 4 and 5 were taken as being truly typical of the Indifferent-Indifferent relation; and in the Unpleasant-Unpleasant type, instead of including all combinations of 6, 7, 8, only the two last, 7 and 8 were used. The complete list of values included in this more refined analysis of the objective records is as follows:

P.P. 1 with 2.
I.I. 4 with 5.
U.U. 7 with 8.
P.U. 1 with 7 and 8
P.I. 1 with 4 and 5.
I.U. 4 and 5, with 7 and 8.

The differences between this criterion of selection and that previously adopted can be easily seen by comparing this list with that given previously.

The averages of the cases obtained gives us the results in columns 4 and 5 of Table XI. Here we find that most of the general tendencies roughly indicated in the previous classification (columns 2 and 3) are corroborated in the finer analysis. Where we have the relation of "likeness" (P.P., I.I., U.U.) the average reaction time is longer, and the average percentage fall in resistance greater than that for cases of "unlikeness" (P.P., P.I., I.U.).

Further to sharpen the distinction between the two types of relative value, results were finally arranged in two classes only, cases of "likeness" and cases of "unlikeness." These results are given in columns 6 and 7 of Table XI. In the case of all but one of the subjects —F.'s cases of percentage fall in resistance—it will be seen that the "likeness" group shows an increase in both reaction time and percentage fall in resistance over the "unlikeness" group. These increases have been expressed as percentages in columns 8 and 9, and with the one exception previously mentioned they are striking enough to justify the following conclusion: *That when the values stand in the relation of "likeness" there is more conative effort in the choice, indicated by an increase in the fall in resistance; and the whole process is of longer duration.*

Table XII expresses the same results in a different form. To compile this the results of all the subjects have been pooled, and a general average calculated for the two extreme types of relative value, "likeness" and "unlikeness." From this calculation we obtain the results given in Table XII, p. 73. There is an increase of 60·7 per cent. in the reaction time, and 23·1 per cent. in the

percentage fall in resistance in cases of a relation of "likeness." These increases are not of such striking magnitude as those shown by some individual subjects, but they are sufficiently high to be significant, and thus to corroborate the conclusion we formulated from the results of individual subjects. The consistency of the results shows conclusively that the theory of an intra-individual scale of similar relative values is sound, and that it provides a reliable method for keeping the conditions for motivation given in the value constant from one subject to another. Thus when we pass on to examine motivation we can safely assume that the objective conditions for the evolution of motives are approximately similar for all subjects, even though the individual impressions of absolute value vary widely and can never be accurately measured.

Table XII. Showing comparison between average reaction time and average percentage fall in resistance when values stand in the relations of "likeness" and "unlikeness."

Relation of "likeness"		Relation of "unlikeness"		Percentage increase	
P.P. U.U. I.I.		P.U. P.I. I.U.		"Likeness" group over "unlikeness" group	
Average reaction time	Average % fall in resistance	Average reaction time	Average % fall in resistance	In reaction time	In % fall
3850	4·42	2395	3·59	60·7	23·1

Results of all subjects pooled.

(4) MOTIVATION.

The classical definitions of Motive fall into two types:

(1) Any conscious element considered as entering into the determination of a volition.

(2) Any conscious *end* considered as entering into the determination of a volition[1].

The second type of definition arises out of attempts to prove that all motives are of the nature of ends. Aristotle finds in his analysis of volition only practical reason and desire. But desire, or the orectic faculty, as used by Aristotle is not a purely pathic or affective element. Theoretically, feeling, as such, is completely passive; enjoyment of the pleasant, or suffering of the painful. For Aristotle,

[1] Baldwin's *Dictionary*.

desire involves an effort towards the attainment of the good. It is impulse with an added quality of feeling.

Thus, the elements contained in desire are:

(1) An idea, or presentative element—the object aimed at.

(2) Effort or activity towards the attainment of this "good"—the conative factor.

(3) Feeling—the affective factor.

The one single moving force is the object of desire, and this is always the "good" or the "apparent good." For Aristotle then, it is the final end that is the initial cause in conduct. Reason, and imagination as a sort of reason, concur with desire in producing action[1].

Definitions of the second type on the other hand leave room for affects as motives; dispositions of an emotional and conative character which do not have the character of presentation in idea. Wundt, for example, distinguishes an affective and an intellectual element in motives, and uses the term *triebfeder* for the affective element, and *beweggrund* for the presented or intellectual element[2]. Wundt appears to emphasise the fact that the feelings, and not the presentations, are the springs of action[3]; and in his exposition of the Tri-dimensional theory of will he shows how a certain development and combination of the feelings, pleasure and unpleasure, tension and relaxation, excitement and depression, can give rise to a new impelling feeling which seems to be the immediate antecedent of the volitional act. Ideas (the "moving reason") according to this theory play a rôle in volition only through the influence they exert on the development of the feelings.

Definitions of such divergent types as these indicate that the old question of the justification for a tripartite division of mental processes is raised in its acutest form when we consider the question of

[1] *De Anima*, III, 10, 433, tr. by Hicks: "The motive causes are, apparently, these two, either appetency or intelligence, if we regard imagination as one species of thinking. By intelligence we mean that which calculates the means to an end, that is the practical intellect. Appetency, too, is directed to some end in every case; for that which is the end of desire is the starting point of the practical intellect, and the last stage in this process of thought is the starting point of action. Hence there is good reason for the view that these two, appetency and practical thought, are the causes of motion. For it is the object of appetency which causes motion: and the reason why thought causes motion is that the object of appetency is the starting-point of thought. Again, when imagination moves to action it does not move to action apart from appetency. Thus there is one single moving cause, the appetitive faculty....It is invariably the object of appetency which causes motion, but this object may be either the good or the apparent good."

[2] These terms are translated by Judd as "impelling feeling," and "moving reason."

[3] In this view it is inconceivable that an act of volition should arise solely from intellectual considerations.

motivation, and the relation of affective states to the act of voluntary decision. Will our analysis of the Motivation Period give evidence that affective states can develop as a third aspect of mental processes, and so give rise, in their own right, to motives; or shall we find that motivation yields predominantly cognitive processes with orectic aspects, both energetic and pathic?

We have already indicated in chapter III that we could find very little report of true affective processes in the introspection period; and that when pleasure and unpleasure appeared in awareness they were reported as modalities of the active tendencies in the desires and aversions which arise as one alternative and then the other comes to the focus of awareness. These desires and aversions are reported as the different motives for action which develop in the act of choice, and the introspections show that the motive force issues from the active aspect of desire.

It must be remembered that our choices were all carried out under the influence of a powerful set of a previous conation: "Choose for a serious reason," etc. The acceptance of this task imposed the obligation to wait for the development of a good motive; this implies deliberation and rationalisation of desires, and such was usually the case. Nevertheless we got cases in which the desire did not appear to be fully rationalised; these approached mere impulses. Indeed, every shade of choice, from pure impulse to fully deliberated choice, was observed.

This strong conative set is, as we shall see, an important controlling factor in the ultimate development of motivation. We are variously attracted or repelled by each alternative in turn. Hence, the process of deliberation is sometimes called the conflict of motives. But our desires and aversions do not struggle among themselves until the stronger comes to predominate. The "Self" intervenes again to direct the trend of conative activity to one course of action rather than another. The "Self" makes one of the motives its own, and in the process of tending towards one end in preference to another we shall show, by quotations from our protocols, that we have a direct lived and cognised experience of the "Self-in-action."[1] This awareness we consider to be the nucleus of the whole volitional consciousness.

We must now pass to an examination of the data on the development of motivation collected in our research.

[1] See chapter VI.

As a result of the close relationship which exists between the value of the tastes and the strength of the motives which arise when they are placed one against the other as alternatives for choice, it follows that many of the points made in the analysis of the Relativity of Value must be discussed again in connexion with the question of the Evolution of Motivation. For example, in dealing with the different relative values which can be presented to the subject we gave numerical results to show (see p. 71) that there was a well-marked difference in the amount of fall in resistance and in the duration of the processes entering into the choice for different types of Relative Value. We noted broadly that where the alternatives stood in the relation of "likeness" the falls in resistance were greater and the reaction times longer than where they stood in the relation of "unlikeness." Also, by reference to the introspection, it was clear that more conative effort was expended over choices between alternatives of "like" or "equal" value.

Thus it is almost self-evident that different types of motivation are found to accompany the different types of relative value.

I. *Motivation in Cases of "Like" or "Equal" Value.*

We will first consider the development of motivation in choices where the alternatives are, as nearly as possible, of similar value. As we have shown in the previous chapter, this relation of "likeness" can occur when two pleasant, two unpleasant, or two indifferent tastes are exhibited as alternatives.

When choice has to be made between two unpleasant tastes there is usually a failure in the development of positive motives for taking one or the other; or, in other words, two negative motives arise, and the subject is faced with the task of developing out of these two negative motives a positive motive strong enough to provide a reason for taking one of the unpleasant alternatives. This type of motivation provides us with the most extreme case of difficult choice, and we shall consider in the course of this chapter the different solutions of the situation to be found in the introspections obtained in our experiments.

In case of choice between the two pleasant or two indifferent alternatives the ultimate situation in the development of motivation is somewhat similar; a stage is reached at which the motive which normally develops for taking one alternative in preference to the

other fails to emerge. In this instance the motive for the ultimate selection is absent because the two motives which do emerge are of equal appeal to the subject. Instead of being repelled from both the alternatives as he was in the case of the two unpleasant tastes, he is equally drawn to them. He could just as easily take one or the other, and the ultimate selection is, in some cases, just as difficult as that arrived at in the case of two negative motives.

The following introspections are typical of reports made during cases of negative motivation. E.g.:

A. 58. "*Zul-Mep* repeated auditorily with the knowledge both were horrible. Very strong negative motivation. Distinct feeling of unpleasure at opposition and helplessness. Knowledge it was taking a very long time. Then a resolve to wait until there was some definite reason (motive). This was a volitional act and was quite strongly present as a consciousness of action. From that point the state of formidable tension gave place to a feeling of relative relaxation; a feeling of waiting. Then consciousness that *Mep* was the more unpleasant. Dim recollection of previous reactions in which *Mep* was chosen. Acceptance of *Mep*, calm and colourless. Until the resolve to let things go on, consciousness was very troubled; a great feeling of impotence."

A. 286. *Zul-Nep*. "*Zul* meant something very nasty. *Nep* recognised as new and distinct from *Mep*. A belief that it was very unpleasant. Eye movements very considerable. *Zul-Nep* repeated several times. Diffused muscular strain. Feeling of absolute impotence and confusion. Nothing but *Zul-Nep* as visual, auditory and kinaesthetic images and muscular strain. Felt reaction would never end. Then with sudden consciousness of action, a relaxation of all this tension, and a quite clear reference to self, I suddenly reacted and shouted out the words, 'I can't choose.' Here the transition from tension, confusion, and very imaginal consciousness, to relaxation and clear consciousness of action was very marked."

Examination of these introspective reports, together with many others, shows that certain factors constantly appear when motivation is of this type. The objective records also reveal factors peculiar to the type:

(*a*) The normal trend of conative activity in the act of choice is impeded: the subject reports that he is "baffled," "helpless," "impotent," "inhibited," etc.

(*b*) Muscular strain and tension develop to a marked degree, the sudden change from tension to relaxation when the inhibition has broken down being most noticeable. Changes in respiration are also often reported, and are corroborated by changes, during and after the reaction period, in the pneumograph record.

(*c*) Displeasure, and other affectively toned contents such as dismay, discomfort, confusion, surprise, etc., make their appearance, the reports indicating that these affective states develop as a result of impeded conation.

(*d*) The instruction—or parts of it—normally out of consciousness, reappears explicitly or implicitly. Thus we have reports such as this: "Knew that if I had to choose for a really good motive, I'd better choose the nastier." (Choose for a serious motive.) "Knew that I would not have taken *Mep* if I had not been obliged." (Choose and drink one.) "Knew that reaction was getting long." (React as quickly as possible.)

(*e*) Hesitation is very common. The subject dwells first on one alternative and then on the other, but neither motive is developed sufficiently strongly to provide a reason for decision; there are often several oscillations of this kind, and the feeling of impotence and helplessness mentioned under (*a*) develops at this stage.

(*f*) Consciousness of "Self" and "Self-activity" is often present in a noticeable degree. We shall go fully into this phenomenon in chapter VI. We need only point out at this stage that this intuition of "Self" seems to be intimately connected with the termination of the whole process of choosing, in a decision to adopt one motive for action rather than another. With reference to motivation we may say that the introspections show that in cases of equivalent or negative motives, at the process of strengthening one of the motives to a sufficient degree for it to become the reason for the choice, we have a momentary but focal, consciousness of the Self-as-active.

Table XIII. Negative and equivalent motivation. Cases of "like" value.

1	2	3	4	5	6	7
Subject	Av. % fall in resistance: N.M. & E.M.	Av. % fall in resistance: all types	% increase in fall in resistance: N.M. & E.M.	R.T.: N.M. & E.M.	R.T.: all types	% increase in R.T.: N.M. & E.M.
A.	3·77	2·75	37·0	2571	1406	82·8
B.	6·0	4·03	48·8	6348	4220	50·4
C.	7·5	6·38	17·6	3804	2696	41·1
D.	2·61	1·19	110·9	2221	1459	52·2
E.	7·0	6·34	10·4	4789	2945	62·6

NOTE. In calculating these averages only choices concerned with the alternatives in the original scale have been included. Choices in which "new" alternatives were introduced have been omitted, for although many marked cases of negative motivation occur in such choices, the effect of the introduction of "new" alternatives was not the same for all subjects. It was thought, therefore, that the inclusion of these cases might distort the results, and that a truer comparison of the results of different subjects would be obtained by omitting them for all. This procedure, however, lowers the average percentage fall in resistance in negative motivation cases for three of the subjects (A., B. and C.).

(*g*) The objective records, notably the psycho-galvanic records of the subject's changes in resistance, and the reaction times measured by the Hipp chronoscope show variations which are undoubtedly characteristic of this type of motivation. Table XIII presents our data on this point. To compile this table, choices in which there was negative motivation and equivalent motivation were classified for five of our subjects. Column 2 gives the average percentage fall in resistance in these cases, and column 3, for purposes of comparison, the average percentage fall in resistance for all types of choice. It will be seen that

with all the subjects the fall in resistance is greater in choices where negative or equivalent motivation occurs. Column 4 gives this increase as a percentage. The reaction times also show variation of a constant type. Column 5 gives the average reaction time for the negative or equivalent motivation cases, and column 6 the average reaction time for all choices. Column 7 gives the percentage increase in the reaction time for negative or equivalent motivation cases.

II. *Motivation in Cases of Unlike Value.*

Generally speaking, where two alternatives are wide apart in value, motivation normally follows hedonic lines, the subject being satisfied that he is making a good choice by acting on the strong motive to take the pleasanter alternative that immediately arises with the development of its value. In our experiments we found that hedonic motivation was the predominant type of motivation in cases of unlike value[1]. Table XV, p. 82, in column 1 gives the percentage number of times different motives occurred. It will be seen that with the exception of subject B. hedonic motives are found much more frequently than those of any other type. The exception in the case of B. can be explained by the fact that only one of the tastes (*Tauk*) possesses a high degree of value; all the others were more or less distasteful to the subject, some extremely so.

The introspections given for choices where this type of motivation occurred show that the motive for taking the alternative of higher hedonic value is the stronger, and that the subject usually decides to adopt it as his motive for action. In this type of motivation there is, normally, no difficult or prolonged deliberation; the subject feels that he has a good motive, and that the decision can be made quickly without further effort on his part. The following reports show that in motivation of this type the trend of conation is smooth and unimpeded, that pleasure often appears as a result of the ease with which the processes concerned with the choice develop; that consciousness of "Self-activity" is not reported in any marked degree; and that strain and tension seldom develop. E.g.:

B. 25. *Vab-Tauk.* "Recognised that *Vab* had an extreme negative value; and there were fragments of verbal imagery equivalent to 'Not that one.' Verified the fact that *Tauk* was the other alternative. Took it with a feeling of relief."

A. 11. *Ziv-Vab.* "Feeling of aversion from *Vab*. *Ziv* in the meantime developed its pleasant meaning, and, knowing well what kind of a motive

[1] Other types of motivation did appear occasionally. For example, one subject sometimes felt impelled to react for an ethical motive by making a serious choice of the more unpleasant alternative. Such cases may however be regarded as exceptional to the predominant type.

it was for me, I accepted it with pleasure." (33) *Laip-Ziv.* "A slowly growing meaning of *Ziv. Laip* contaminated: was nicer than my ordinary judgment of it. Meaning of *Ziv* seemed to develop. The word 'Yes,' in inverted commas, auditorily, with the knowledge, 'I like that.' *Ziv* seemed to be attracting me rather than my determining it. I seemed to be passive. *Ziv* seemed to draw me. Chose *Ziv* and drank with pleasure."

D. 72. *Laip-Vab.* "Recognised both simultaneously. *Vab* suddenly took on a clarity which the other did not have. Rushed away precipitately to *Laip.* A clutch at it to get away. Both then immediately went out of consciousness completely. Just conscious of fleeing away from something I wished to escape. Whole operation very hurried. Feeling of relief on taking *Laip.*" (79) *Klum-Mep.* "Recognised *Klum* first with a sort of mild curiosity to recall taste. Only recalled as 'sour.' Passed to *Mep.* Recalled as 'salty.' Thought it would be more agreeable than *Klum.* Took it. Very slight consciousness of action. Would not have recognised it had I not experienced it before."

The objective records—psycho-galvanic deflection and reaction time—correlate with the reports of ease and rapidity in the development of the conative processes concerned with the choices.

The figures in column 1 of Table XIV show the average percentage fall in resistance for choices where Hedonic Motivation was reported: column 3 indicates that there was invariably a decrease in the amount of fall in resistance. Column 4 gives the reaction time for the "Hedonic" type, and column 6 the percentage decrease on the reaction time for this type compared with that for all types of motivation.

Table XIV. Hedonic motivation. Cases of "unlike" value.

	1	2	3	4	5	6
Subject	Av. % fall in resistance: "Hedonic"	Av. % fall in resistance: all types	% decrease in fall in resistance: "Hedonic"	R.T.: "Hedonic"	R.T.: all types	% decrease in R.T.: "Hedonic"
A.	2·49	2·75	9·4	1373	1406	2·3
B.	2·9	4·03	28·0	3368	4220	20·2
C.	5·4	6·38	15·4	2161	2696	19·8
D.	1·17	1·19	1·7	1387	1459	4·9

We may at this point examine our evidence with regard to the *question of the strengthening of motives.* In connexion with this question an obvious classification of motives seems to be suggested. From this point of view motives may be classified into:

(1) Motives which need no strengthening.

(2) Motives which have to be strengthened before they can be adopted as the reason for the choice.

We may note here that, up to this point, investigators—notably Michotte and Prüm, and Boyd Barrett—have classified motives into Objective motives and Subjective motives. Objective motives they state may be Intrinsic, when the basis of the motive lies in some quality of the thing itself, or Extrinsic, when it lies in some accidental external circumstance. Subjective motives, according to these authors, appear as sudden impulses to take one alternative at random, or capricious tendencies to change habitual choices.

The classification hitherto used seems somewhat unsatisfactory. In the first place it attributes to motives a spurious objectivity which is not to be found when we consider them in their setting of the total will-act.

In the second place, all motives, of whatever kind they may be, have in their right setting a strongly subjective character; they arise because the "Self" has adopted a specific mental set by acceptance of an instruction to choose for a serious motive; they appear to "conflict" because they fail to satisfy the "Self," and the "Self's" standards of value. One, sometimes the weaker one, ultimately passes over into action because the "Self" voluntarily prefers it, and adopts it as a reason for decision.

Thus, although the classification we suggest leaves much to be desired, it has the advantage of enabling us to keep in sight the subjective character which all motives possess.

Motives which need no strengthening correspond to the so-called Objective motives. In our experiments they were the Hedonic motives, and we have just shown in a previous paragraph that they normally occur when the values stand in the relation of "unlikeness": to take a typical example, we may look at an introspective report of the development of motivation when the alternatives stand at the two extremes of the hedonic scale. E.g.:

D. 99. *Ziv-Zul.* "Recognised both simultaneously but *Ziv* stood out much more clearly. I knew I was going to choose *Ziv*, but swung attention to *Zul* to obey conditions of the experiment. Took a casual glance; returned to *Ziv*. Took it with a little emotion of satisfaction. Very slight consciousness of action; seem carried a very short distance."

A. 177. *Tauk-Vab.* "*Tauk-Vab* repeated auditorily and kinaesthetically. *Tauk* was known to be the one. No sensorial content connected with this."

Here we see that a motive for taking the unpleasant alternative either fails to develop at all, or else it is of a strongly negative character. On the other hand, the motive which arises when the value of the

Table XV. Motive—Summary.

Type of motive	1 % occurrence of each type	2 % fall in resistance for each type	3 % difference in fall: "Hedonic" and "Self"	4 % difference in fall: "Hedonic" and "Hedonic after conflict"	5 % difference in fall: "Hedonic" and "Ethical"	6 Reaction time for each type	7 % difference in R.T.: "Hedonic" and "Self"	8 % difference in R.T.: "Hedonic" and "Hedonic after conflict"	9 % difference in R.T.: "Hedonic" and "Ethical"
SUBJECT A.									
"Hedonic"	63·3	2·49	—	—	—	1373	—	—	—
"Self"	21·2	3·65	+46·6	—	—	3198	+123·9	—	—
"Hedonic after conflict"	4·7	4·7	—	+88·7	—	2464	—	+125·8	—
"Ethical"	3·9	3·14	—	—	+26·1	2730	—	—	+98·8
"Degree and duration of consciousness"	7·9	2·4	—	—	—	3085	—	—	—
"Impulse, caprice, desire to change"	0	—	—	—	—	—	—	—	—
"Extraneous"	0	—	—	—	—	—	—	—	—
"Familiarity"	0	—	—	—	—	—	—	—	—
SUBJECT B.									
"Hedonic"	33·9	2·9	—	—	—	3368	—	—	—
"Self"	56·6	5·26	+81·4	—	—	5075	+50·7	—	—
"Hedonic after conflict"	1·8	6·4	—	+120·6	—	5091	—	+51·1	—
"Ethical"	0	—	—	—	—	—	—	—	—
"Degree and duration of consciousness"	5·3	6·7	—	—	—	6922	—	—	—
"Impulse, caprice, desire to change"	7·1	5·7	—	—	—	3677	—	—	—
"Extraneous"	0	—	—	—	—	—	—	—	—
"Familiarity"	0	—	—	—	—	—	—	—	—
SUBJECT C.									
"Hedonic"	65·8	5·4	—	—	—	2161	—	—	—
"Self"	26·3	7·7	+42·6	—	—	3543	+63·9	—	—
"Hedonic after conflict"	0	—	—	—	—	—	—	—	—
"Ethical"	0	—	—	—	—	—	—	—	—
"Degree and duration of consciousness"	1·3	10·7	—	—	—	6380	—	—	—
"Impulse, caprice, desire to change"	1·3	1·7	—	—	—	5975	—	—	—
"Extraneous"	5·3	4·9	—	—	—	2566	—	—	—
"Familiarity"	0	—	—	—	—	—	—	—	—
SUBJECT D.									
"Hedonic"	54·1	1·7	—	—	—	1387	—	—	—
"Self"	26·5	1·48	+26·5	—	—	1737	+25·2	—	—
"Hedonic after conflict"	0	—	—	—	—	—	—	—	—
"Ethical"	0	—	—	—	—	—	—	—	—
"Degree and duration of consciousness"	14·3	1·1	—	—	—	1831	—	—	—
"Impulse, caprice, desire to change"	4·1	0·97	—	—	—	1553	—	—	—
"Extraneous"	0	—	—	—	—	—	—	—	—
"Familiarity"	1·0	0·3	—	—	—	1582	—	—	—

pleasant alternative develops is strongly positive. Normally, it needs no reinforcement at all in order to be adopted as the reason for the choice. In the first place it completely fulfils the conditions laid down by acceptance of the instruction, "Choose for a serious reason." This instruction creates a mental set to come to a decision in the process of choosing only when a certain standard of value has been developed.

It must be noted that this instruction, "Choose for a serious reason," was normally interpreted by our subjects to mean, "Choose the best." Thus, when a strong positive motive arises for taking the pleasanter alternative, it completely fulfils this standard of value. The "mental set" created by the acceptance of this instruction receives no check, and the whole process can be terminated, without further deliberation, by a voluntary acceptance of the motive as the reason for choice. In the second place, such a motive fulfils the conditions for the smooth functioning of the "mental set" created by the acceptance of the second part of the instruction, "React as quickly as possible." The "good" motive has emerged. Immediate decision to adopt it will bring the process to a speedy termination, thus fulfilling the accepted conditions. On p. 79 we quoted from introspections obtained during this type of motivation, and they clearly reveal the fact that we now wish to establish, viz. that there is a type of motive which needs no strengthening; one which is strong enough at the moment of its development to reach the "Self's" standard of value. Table XV gives a summary of numerical data on the subject of motivation. Column 1 gives the percentage number of times a given type of motivation appeared in the total choices of the different subjects. We have already seen that motivation of the type under consideration (that in which no motive strengthening is reported and where an "Hedonic" motive developed) predominated with all but one of the subjects. Table XV (cols. 2 and 6) shows that the average percentage fall in resistance is low and the reaction time short for motives of the Hedonic type. On the theory we advanced as to the cause of variations in magnitude of fall in resistance we should expect such to be the case. The introspections show that very little conative effort is expended over the decision; that no obstacle impedes the conative trend of the "mental set"; that the motive reaches its "critical point"[1] immediately and without conflict.

[1] Boyd Barrett defines the "critical point" as "That degree of strength, which being reached by the motive, the choice results automatically," *Motive Force and Motivation Tracks*, p. 83.

Motives which need strengthening before they can be adopted as the reason for choice. If the motive for taking a given alternative fails to reach that standard of value established by the instruction, the whole process of choosing is "held up" until some further reason for making a decision in its favour develops to strengthen the motive which by itself is too weak to reach the "critical point." The introspections show clearly that the normal trend of conation was inhibited by reason of this failure in the development of a "serious" motive. They also indicate the different methods by which new motives were developed or weak ones strengthened in such cases of inhibition. We will enumerate the different forms of motive strengthening occurring in our experiments, and then discuss and illustrate the type.

Motives were made or strengthened:

(1) By reference to "Self" and appeal to an ethical principle.
(2) By reason of the temporal factor.
(3) By the degree of consciousness for a given alternative.
(4) By capricious impulse and desire to change.
(5) By extraneous circumstances.

(1) *The making of a motive by a reference to "Self."* This was the most interesting and frequent type of motive strengthening. It occurred during choices in which two negative, or two otherwise "equal," motives developed. We have previously stated that this type of motivation occurred when the values of the alternatives stood in the relation of "likeness." The figures given in the second line of column 1 (Table XV) show the frequency with which a motive was made or strengthened by the "Self": it will be seen that while for most of the subjects this type does not appear as frequently as the "Hedonic" motive, it does nevertheless appear quite often. In one subject (B.) it predominates over the "Hedonic" motive, and we have previously pointed out that, owing to peculiarities in individual preference, the hedonic scale for this subject was not smoothly graded in its progression from pleasant to unpleasant, but that five of the tastes were evaluated as distinctly unpleasant. Thus, negative motivation predominated, and the occasions on which a motive had to be created were much more frequent. Choices in which motives had to be strengthened in this way were typical cases of "Hard" choice. The subject was faced by two alternatives, both of which were unpleasant. He was obliged, by virtue of his acceptance of the instruction, to adopt one of them; that is, he had to force himself to an unpleasant course of action. E.g.:

B. 17. *Vab-Laip.* "Realised I did not want to drink either. Hesitation, and a vague mental content containing thoughts about negative motivation. Still more hesitation. Then with a distinct reference to "Self," I designated *Laip* with strong consciousness of action."

A. 77. *Jor-Laip....* "A kind of inhibition: fear that no motive would arise, and a mental state equivalent to 'I must choose.' Still seemed to be about equal in value. Then an intentional designation of *Jor* with consciousness of action. This choice of *Jor* really seemed due to a heightening of its hedonic value by something given it from myself." (35) "*Vab-Laip* repeated; unpleasure strongly marked....Then an intentional direction to *Vab* with the knowledge, 'They are both bad, that's the worst.' 'I will,' strongly auditorily and kinaesthetically. Tension from eyes, neck and forehead which almost masked my consciousness of action. The consciousness of action seemed to be similar to my intentional direction. This is how I can discriminate it out of the massed sensations of muscular effort. This was a forced choice. The 'I will' had reference to my bodily drinking the thing." (252) "Wonder as to what *Ler* was. Knowledge of pleasantness of *Tauk*. A balance of motives—between knowledge pleasant and desire to know. Fairly equal. Reference to 'Self,' and consciousness of action. *Tauk* chosen and drunk. This reference has the value of 'I will choose this,' and seems to decide definitely the preponderant motive."

D. 113. *Klum-Mep.* "Felt an unfriendly feeling towards *Klum*. Forced myself to take it. Felt I should not take it if not forced, but I *chose* it, and was conscious of a lagging sort of motion towards something indefinite off to the right of the field, as if to put off taking it as long as possible."

Occasionally, in choices between pleasant and unpleasant alternatives, the ultimate decision was rendered just as difficult as that between two unpleasant alternatives by reason of a different interpretation of the instruction, "Choose for a serious reason." We have stated that subjects usually interpreted this as "choose the best." But in the earlier experiments subject A. interpreted this as an obligation to choose for an ethical motive. He therefore often forced himself to take the more unpleasant alternative for this reason. E.g.:

A. 66. "*Mep-Vab* present in a sort of jumble. Clear knowledge both very unpleasant. Nearly equally so. Conscious that it was taking time. Oscillation. Distinct feeling of strain. Tendency to choose *Vab* as the less unpleasant. Then with consciousness of action, a rejection of *Vab*, and a knowledge equivalent to, 'If I have to choose for a really serious motive I had better choose *Mep* because it is the more unpleasant.' Floating notions of ethical grounds. I accepted rather than chose *Mep*. A feeling of unpleasure at the beginning."

This tendency to accept an ethical motive for action was, however, soon abandoned by this subject. Reference to Table XV shows that it only appeared 3·9 per cent. times, and the introspections show that after Experiment 66, out of a total of 308, it was never accepted. Occasionally it developed, but was not adopted in favour of its rival,

the hedonic motive. We classified these cases of conflict between "Ethical" and "Hedonic" motives, and have called them "Hedonic after conflict"—see Table XV, line 3.

It will be noticed that the Ethical motive was never accepted by any of the other subjects—see Table XV, line 4. The introspections on this type of motive-strengthening show:

(1) That considerable conative effort is brought to bear upon the situation.

(2) That in the process of strengthening the motive to the point at which decision can be made in its favour, the subject has a momentary focal intuition of "Self," and of "Self" in the act of directing conative energy towards the alternative which has no hedonic appeal.

(3) That the state of tension and helplessness with its accompanying feeling-tone of unpleasure is resolved as soon as decision is reached: unpleasure appears to develop as a result of the painful suspense, and inhibition, rather than as a consequence of the actual taking of the unpleasant alternative.

(4) That this form of motive-making and strengthening can, like any other form of motivation, become habitual. We found that with frequent repetition of the difficult situation, the subject came to a decision without further conflict, along lines similar to those which he followed in the first cases of difficult choice. Thus many stages in the earlier form of motivation by a reference to "Self" are omitted. Impatience, confusion, and unpleasure no longer develop when two alternatives appear. The known solution is applied quickly.

Our objective records appear to corroborate facts reported in the introspections. Line 2 of column 2 in Table XV gives the average percentage fall in resistance for cases of choice in which a motive was strengthened by "Self." It will be seen that for all subjects the fall in resistance was greater in the case of motivation, which, for brevity, we have called "Self," than in cases of "Hedonic" motivation. The percentage of increase has been worked out for all the subjects. For example, with subject A. the average percentage fall in resistance for all cases of Hedonic motives was 2·49 (see line 1), and that for all cases of "Self" motives 3·65 (see line 2). This gives a percentage difference between "Hedonic" and "Self" motives of + 46·6 per cent. (see col. 3). Similar increases in the amount of fall in resistance will be seen in column 3 for all the other subjects. Column 6 gives the average reaction times for different types of motive. In the case of all subjects it will be seen that the reaction times are longer when a motive has to be made or strengthened by "Self" than they are in cases of Hedonic motivation. Column 7 for all subjects gives the percentages of increase in the length of the average reaction time for the "Self" type compared with that for the "Hedonic" type of motivation.

We noted, when quoting introspections illustrating this type of motive-strengthening, that subject A. sometimes voluntarily strengthened the motive for taking an unpleasant alternative in this manner, even when he had the option of taking a pleasanter one. We called these motives "Ethical" motives; and column 2 shows that the fall in resistance is greater than that for the "Hedonic" type. Column 5 gives this increase as a percentage. We also noted that, with this subject "Ethical" and "Hedonic" motives sometimes led to a conflict in which the Ethical motive was finally vanquished. Columns 2 and 4, line 3, give the average percentage fall in resistance for this group, and the figure indicates that considerable conative effort must have been directed towards a solution of the conflict.

(2) *Strengthening of a motive by the temporal factor.* As a typical case of motive-strengthening of this type we may consider a choice in which there is negative motivation or its equivalent. The impotence, the hesitation, the oscillation from one motive to the other have already been described. One motive may be recognised as slightly stronger than the other, as for example, when one alternative is recognised as a degree less unpleasant than the other. This in itself, however, does not provide a strong enough reason for the "Self" to intervene, making the motive its own motive, in the act of voluntary decision. If, during this period of hesitation, the influence of the instruction appears implicitly in a knowledge that the reaction is taking a long time, the process very frequently comes to a speedy termination in a decision to adopt the motive which previously fell short of the "Self's" standard of value. The introspections make it clear that the knowledge that the reaction was taking too long supplied a second motive, which added to the already developed weak motive for taking one of the alternatives, provided a reason strong enough for the "Self" to direct the trend of conative activity to one course of action rather than another. E.g.:

A. 30. *Vab-Jor.* "Knowledge *Vab* was unpleasant, and that *Jor* was not unpleasant. Aversion from *Vab*. I kept on looking at *Jor*; *Vab* was quite in the background. Then, slowly, I realised it was taking time. *Jor* gathered more meaning, and presented itself as indifferent, but preferable to *Vab*: a faint consciousness of action."

B. 59. *Vab-Zul.* "Momentary 'blank.' Then read again. Hesitation, feeling of helplessness. Felt I simply could not choose either of them, and that I could not make a voluntary decision to end the reaction. Was conscious that time was getting very long. Read alternatives for the third time.

Then with consciousness of action, and a reference to 'Self,' I concentrated my attention on *Vab*, and decided to take it, my motive being simply to 'end this.' I think there was an intentional knowledge of the way in which I had previously terminated such reactions."

D. 81. *Jor-Laip.* "Recognised words simultaneously. Had difficulty in making up mind which to choose. Made another comparison. Recalled *Jor* a very indifferent taste, and *Laip* had some sweetness. Felt time getting long. Took *Laip* with a sort of mental sigh of relief to have the thing over."

Although consciousness of "Self-activity" does not appear to be clearly introspectible as it was in the case of motive-strengthening previously discussed—that in which the "Self" had to intervene and create a motive—we have to recognise that the type of motive-strengthening just illustrated is equally a function of the "Self." It seems clear that the temporal determination of the whole process would not have provided a motive for decision had it not been for the "Self's" previous volitional acceptance of the instruction to react as quickly as possible.

(3) *Strengthening of a motive by the degree of consciousness.* A case of motive-strengthening very similar in its development to that just given is seen in cases in which, during the period of hesitation, one of the alternatives develops a greater degree of clearness and determinateness in consciousness. When this occurs, it is common for decision to be made in favour of the alternative possessing the higher degree of consciousness. E.g.:

A. 181. *Zul-Laip.* "A knowledge from the beginning that *Laip* was less unpleasant than *Zul.* Still that did not seem to be a motive. Then, progressively *Laip* came to dominate consciousness; *Zul* faded into the background. *Laip*, so to speak, imposed itself. There were eye-movements and a certain amount of tension. Re-acted and drank *Laip.*"

B. 28. *Laip-Mep.* "Long hesitation owing to disinclination to drink either —a feeling, 'Both are bad.' 'You've got to make a motive.' 'It doesn't much matter which one so long as you end it.' Seemed no intrinsic reason for taking either. While this was going on I was looking at *Laip*, and the reaction followed abruptly, I think from this cause."

E. 7. *Klum-Zul.* "Something seemed to say, 'Stop and think which is the best. Choose for a good reason.' A feeling, no words present. Looked from one to the other. No reason came. Found I was saying rapidly, 'I must hurry up and choose.' Tension and annoyance seemed to be increasing. Seemed to reach a breaking-point. Then my eye happened to fall on *Klum.* Found I was taking it."

Many of the introspections make it clear that the relative degree of clearness and determinateness of the two alternative courses of action is developed according to the laws of conative control; that

the alternative to which the "Self" directs attention rises to the focus of awareness, while the other fades. It was found that when choices inducing hesitation had been repeated two or three times in the course of the experiments, several subjects remarked that they had discovered that "dwelling on one alternative" after a period of unpleasurable oscillation and inhibition was often sufficient to lead to its ultimate acceptance by the "Self." E.g.:

A. 200. *Mep-Vab.* "Eye-movements and a certain amount of strain. About equally balanced. Then with consciousness of action I allowed my gaze to rest on *Vab*, with belief it would become motiveful. Knowledge this had happened in previous cases. *Vab* seemed actually to grow, and came to dominate consciousness. Very marked. Was slow enough to be easily observed." (211) "Knowledge that contemplating one alternative seemed to effect a choice. Deliberate contemplation of *Zul*. *Zul* increased in consciousness, I think *Mep* faded right away. I let the reaction go on though I knew it was taking time until *Zul* developed as a sole alternative. No consciousness of action except possibly at the point where I resolved to contemplate *Zul*, but exceedingly faint."

B. 32. *Jor-Mep.* "Remembered my mental set in cases of negative motivation, and turned my attention at once to *Jor*, with consciousness of action. Rested on it."

And in future similar cases, this device of holding one alternative only in the focus of awareness was voluntarily adopted as a means of preventing hesitation and producing a speedy decision. The conative processes underlying this form of motive-strengthening have been initiated by the mental set to choose "one" of the alternatives; no other part of the instruction appears to be operative. The mental set to "choose for a serious motive" has been suppressed by a fresh voluntary decision to inhibit further discussion of motives by a deliberate concentration on *one* course of action only. By virtue of the quantitative principles operative in the process of cognition, the other alternative sinks into marginal awareness, leaving its rival in sole possession of the focus, to issue in action after the manner of all "fixed ideas." It is interesting to notice that the process just described is a special case of motive-making by the "Self" in the only possible way left—that is, by a fresh voluntary decision to readjust the conative set created by the instruction, so that part of its functioning is inhibited.

Table XV, line 5, columns 2 and 6, gives the average percentage fall in resistance and the reaction time for these last two types of motive-strengthening grouped together. It will be seen from the figures in column 1 that the occurrence of this motive was comparatively infrequent. Results given in column 2 (the average percentage fall in

resistance) are somewhat conflicting. In two cases, B. and C., there is a great increase in the fall in resistance over that occurring in the "Hedonic" type: the other two subjects show an average percentage fall approximately equal to that in the "Hedonic" type. Judging between these two results in the light of our general theory of the psychological significance of the psycho-galvanic reflex[1] we should be inclined to say, given more examples of this type of motivation, that the results of B. and C. are more truly typical: the conative effort involved in such processes is undoubtedly greater than in choices where a strong hedonic motive arises.

The reaction times for all subjects indicate, as we should expect, that choices where this type of motive-strengthening occurs are made less quickly than those in which a hedonic motive was accepted. It will be noticed that of all the types of motivation classified in Table XV this type has, consistently, the longest reaction time. Thus we have an interesting objective corroboration of the introspective report of motivation, viz. the temporal determination of the choice.

(4) *By capricious impulse or desire to change.* The following examples illustrate this type of motive-strengthening. E.g.:

B. 2. *Ziv-Mep.* "First recognised the meaning of *Ziv* as the one I had chosen in the first reaction, then meaning of *Mep* came with knowledge I hadn't considered *Mep* as bad as some of the subjects. The knowledge I had chosen *Ziv* in the first reaction seemed to turn me at once to *Mep*, so I said the words 'Why not try *Mep*. It's not so bad.' Slight traces of visual imagery of the words. Drank *Mep*, to find it much worse than I thought."

B. 27. *Ziv-Klum.* "Meanings did not come really clearly: but I did realise that neither had an extremely negative value. I was about to take *Klum* when for some reason I cannot find I changed quickly to *Ziv*, and drank it. When it was in my mouth there was a shock to find it was one I do not like, and displeasure."

D. 12. *Mep-Klum.* "...A puerile motive. Had chosen *Mep* twice and would not take it again. Real reason, desire for change. I was not really drawn towards *Klum*." (21) *Laip-Mep.* "...A kind of frivolous choice in its motive. Recognised them immediately. Neither appealed much. Attention went back and forth. My reason—I took *Laip* before; take *Mep* now. There was not that brightness I have reported previously."

These reports indicated that the motive for taking one of the alternatives suddenly gains the ascendancy on account of a subjective tendency which reinforces it very rapidly. Deliberation appears to be cut short. If the "good" motive develops at all, it does so under the disguise of a capricious subjective preference. When the subject

[1] See chapter III.

merely gives as his reason for acting "desire for change," his introspective report of the process indicates that it is "a very poor sort of choice." This statement can be interpreted as meaning either that the subject feels that he has not fulfilled the instruction to wait for a really good motive to develop, or that the reaction is an impulsive liberation of the conative energy of the mental set, rather than a truly volitional direction of it by a voluntary decision. The length of the average reaction time in subjects B. and D. compared with that for the "Self" type of motive, or that in which degree and duration of consciousness provided the final motive, indicates that the subject does not wait for the processes of evaluation and deliberation to develop fully, but cuts them short by this sudden subjective impulse. The average percentage fall in resistance for two of the subjects C. and D. shows that motivation of this type calls for very little conative effort.

(5) *Strengthening of a motive by extraneous circumstances.* Table XV shows that this motive occurred with only one of the subjects, and then not more frequently than 5·3 per cent. times.

The introspections indicate that factors such as the amount of liquid in a glass, marks on the side of the glass, etc., influence the development of motivation. E.g.:

C. 30. "Attention kept wandering from one to the other. Feeling of displeasure and perplexity. Knowledge both were very unpleasant to me. Then had a state equivalent to, 'Well, I must choose one and end this.' Then there was a knowledge that the quantity to be drunk was not very large so I chose *Mep*." (37) "...On studying position of *Zul* on the card I also remembered that the glass corresponding to *Zul* held a fair quantity of the liquid. This seemed to cause a mental rebound to *Mep*. Accepted and drank it with violent displeasure." (41) "Recognised *Zul*, meaning 'nasty' developed. Swing of attention to other. Recognised *Tauk*, and that it possessed a high value. Feeling of pleasure, because I had noticed corresponding glass contained more liquid than other. This almost seemed to form another motive."

The figure in column 1 (5·3 per cent.) shows that this form of motive-strengthening was not, however, of frequent occurrence. The average percentage fall in resistance, compared with that for the "Hedonic" group (5·4 per cent.), that for the "Self" group (7·7 per cent.), and that for "Degree and Duration of Consciousness" (10·7 per cent.), indicates that this form of solution called for a less vigorous direction of the "Self's" conative energy.

"Habitual" Choices.

With repetition the development of the processes entering into volitional consciousness tends quickly to become habitual. All investigators into volitional processes have found this to be the case. Boyd Barrett remarks that there is a natural tendency towards "automatic" choosing, and that "automatism is the natural issue of normal motivation...a manifestation of the protective economising tendency of volitional functioning."[1] He goes on to say that he understands "automatism" in a wide sense "as being that state arrived at by the will when it functions evenly, simply and regularly in a manner more or less independent of conscious attention."[2]

That such a stage in volitional functioning is reached is indubitable; but we feel that, keeping within the ordinarily accepted meanings of the terms, "habitual" rather than "automatic" choosing better expresses the psychological constitution of the process.

In the formulation of his theory of "Motivation Tracks"[3] Boyd Barrett points out that there is economy in every sense. He shows that:

(1) Psychical phenomena tend to disappear, though structural phenomena tend to persist.

(2) Reaction times diminish.

(3) The same choices tend to repeat themselves in practically the same manner; the motives are the same though they become modified in form.

Our experiments corroborate these conclusions regarding the formation of a habit of choice. We found that, with repetition, motivation tended to become considerably simplified, and, from the point of view of obtaining complete and detailed introspective reports, this was a disadvantage. We therefore sought for some device which would delay the development of a habit of choice. It was at this point in the research that we carried out the plan of introducing new, and therefore unevaluated, alternatives. The subject was suddenly, and without warning, forced to make a choice between one of the well-known tastes, and a completely new one. This had the immediate effect of arresting the tendency to choose along habitual lines, and of necessitating complete and explicit evaluation and motivation; especially was this so if the known alternative was very low in the hedonic

[1] *Motive Force and Motivation Tracks*, p. 141.
[2] *Ibid.* p. 142. [3] *Ibid.* pp. 105–141.

scale, e.g. *Vab*, *Zul* or *Mep*. Analysis of situation such as these enabled us to trace the development of two new and powerful factors influencing the development of motives; viz. curiosity and belief.

The "New" Motives.

We will first examine the motivation of choices between a "new" alternative, and one which was known from past experience to be extremely pleasant. The introspective reports of such choices show the development and conflict of two opposing tendencies, desire to take the alternative which experience has proved "good," and curiosity to discover the nature of the unknown alternative. In the case of the one subject whose data on this point have been worked up, the motive reinforced by the instinct of curiosity was often accepted by the "Self," in preference to the motive for taking the known "good." This type occurred in ten cases. The introspections of the choices motivated by curiosity indicate, however, that they should be placed in the category of "difficult" choices. There is an element of risk in accepting the motive created by curiosity; the tendency to take the already tried and proved alternative is not rejected without effort, and it seems clear that acceptance of "desire to know" as a serious motive, for the choice is really a special case of "Motive-strengthening by a reference to Self."[1] It is favoured because "*I* want to know," "Because it is important *for me* to know," "Because *I* have a good motive," etc.; and at such moments of acceptance an immediate awareness of "Self-activity" is invariably reported. E.g.:

> A. 226. "*Yuf-Ziv* read: *Yuf* rather prominent. Slight confusion. Recognitions of *Yuf* as a new alternative but it carried no meaning. *Ziv*'s meaning developed rather gradually. Did not recognise it as the most pleasant, only as pleasant. *Yuf* again auditorily and kinaesthetically. A motive in an intentional form, 'I want to know what *Yuf* is like.' Consciousness had that value. Might just as well be explained, 'To ascertain what *Yuf* is like is important for me.' That seemed to be the volition. A quite definite consciousness of action."

That the experience arising from the direction and concentration of the "Self's" conative energy towards acceptance of the unknown, and possibly very unpleasant, alternative is especially intense—sufficiently intense in fact to emerge into awareness—receives interesting corroboration from the psycho-galvanic records. The average percentage fall in resistance for cases where the accepted motive was

[1] See p. 84.

"curiosity" was 4·8, compared with the general average of 3·07. This represents an *increase* of 43·3 per cent. The cases in which the subject accepted the motive to take the alternative which was known to be pleasant had a fall in resistance of 2·05, a *decrease* on the general average of 33·2 per cent. Thus the objective record bears out the introspective report of the amount of conative effort; it is easier to take a pleasant alternative than to force the "Self" to accept an unknown one.

A somewhat similar type of motivation occurred when a "new" alternative was presented with one which was known to be very unpleasant. Here we find curiosity in conflict with the desire to avoid the unpleasant. The new alternative *may* be bad, possibly worse than the old; but there is a chance that it may prove very pleasant: in any case "the desire to know" will be satisfied. Deliberation on these lines reinforces the tendency springing from curiosity, and in the ten cases of this type occurring in our research we found that curiosity motivated the choices every time. E.g.:

A. 220. *Zul-Yuf.* "*Zul* seen: puzzled at *Yuf.* Recognised as new. Hesitation. Then back to *Zul*; recognised as one of the unpleasant ones. Immediate bound back to *Yuf*; not visual or sensorial; a quite distinct though not strong consciousness of action, with the knowledge that I would take this because it would be a new experience, and could not be worse than *Zul.* Quite imageless."

The average percentage fall in resistance for the ten cases was 4·1, giving an *increase* of 33·5 per cent. Thus the reports are again corroborated; a good deal of conative effort is required to bring about decision, but the conflict is, on the whole, less intense than that occurring in the previous type. A comparison of the amount of increase in the respective cases (43·3 per cent. and 33·5 per cent.) bears this out.

As the experiments continued the "new" alternatives gradually became known. During this process of evaluation we were also in a favourable position for tracing the development and strength of "belief" or "opinion" as a factor influencing motivation[1]. While the new tastes were still imperfectly known, recognition of them nevertheless often involved some degree of opinion as to their hedonic value. Sometimes this was so strong that it approached

[1] The terms "opinion," "certainty," "conviction," "knowledge," "belief" have been used with such varying connotations that we have employed in this section only the two, "opinion" and "conviction," to express, the one a weak or moderate belief, the other a strong belief or certainty. This usage makes the two terms fit under the general head of "belief" as quantitatively rather than qualitatively differing, in the same way as "belief" and "knowledge" are used in ordinary discourse.

conviction. At other times it was weak, and correspondingly of little influence in the deliberation. It would seem that weak opinion (as in the case of the partially remembered new tastes) and conviction (as in that of the well-remembered ones) could in our choices, create tendencies and conflicts of different types.

One of the most interesting types occurred when a weak opinion as to the pleasantness of a new alternative was in conflict with a conviction of the unpleasantness of the old. The opinion produced a positive motive for taking the new; the conviction a negative motive for avoiding the old. In every case of this type the tendency produced by weak opinion with regard to the new alternative was finally strong enough to gain acceptance as a motive for decision. E.g.:

A. 291. *Zul-Suj.* "Knowledge *Zul* was unpleasant. *Suj* recognised as having been seen before: no hedonic value. A mental turning away from *Zul.* Then belief *Suj* might be pleasant. Then knowledge equivalent, 'I'll chance it.' Some muddled verbal imagery, very indefinite. *Zul* passed from consciousness. *Suj* was designated with moderate degree of consciousness of action."

The average percentage fall in resistance for this type is 4·0. This gives an *increase* on the general average of 30·3 per cent., and shows, as the reports indicate, that the "Self" does not accept this motive without effort.

A weak or moderate opinion, and a conviction were also found to give rise to conflicting tendencies when there occurred a weak opinion as to the pleasantness of a new alternative, and conviction of the pleasantness of the old. In three out of the four instances of this type of motivation, the tendency created by the opinion failed to gain acceptance in opposition to the strong tendency to take the alternative known to be pleasant. The average percentage fall for the three cases is 1·9, a *decrease* on the general average of 38·1 per cent. This is significant, because as we should expect, little effort is involved in acceptance of a motive to take the pleasant. Moreover, in the one case in which the subject strengthened the tendency created by the weak opinion, and accepted it as the motive for the choice, there is a fall in resistance of 9·3, an *increase* of 202·9 per cent.[1]

The following introspections illustrate this type of motivation. E.g.:

A. 270. *Ziv-Cas.* "*Ziv* meaningful. Belief *Cas* nice. *Ziv* attracted me, but there was a motive in belief in niceness of *Cas*, also a wish to verify this

[1] We do not, of course, claim that any general conclusion can be validly drawn from this one instance. It seems interesting, however, to find that the result fits in with our general theory of conative effort. Given more instances, the fall in resistance might possibly prove to be of the type indicated.

belief. Was held up; these two motives pretty well balanced the one for *Ziv*. Then a thought equivalent to, 'Oh well. I know what *Ziv* is and it is nice. I won't risk it.' *Ziv* pronounced again with emphasis."

We also found six instances in which a moderately strong opinion and a conviction produced negative motives. In these cases there was a strong opinion as to the unpleasantness of the "new," and conviction as to the unpleasantness of the "old." E.g.:

A. 251. *Mep-Suj*. "Feeling of helplessness. Knowledge *Mep* was unpleasant. Fairly strong belief *Suj* was also unpleasant. Belief became a weak conviction. No discernible tension, but ultimately with consciousness of action, and distinct reference to 'Self,' *Suj* was designated as at any rate less unpleasant than *Mep*, but a belief it might be just about as unpleasant."

In three cases the subject solved the problem by creating a motive for accepting the taste he "*believed*" to be unpleasant in preference to taking that which he knew to be unpleasant. These cases have an average percentage fall of 1·6, a *decrease* on the general average of 47·9 per cent. In the other three cases he preferred conviction to "belief," and accordingly accepted the tendency to take the unpleasant but perfectly known alternative. The average percentage fall for these three cases is 3·9, an *increase* of 27·0 per cent.

The psycho-galvanic records show, therefore, that less conative energy is directed towards the acceptance of the alternative "*believed*" to be unpleasant, than of that *known* to be unpleasant. The introspective reports also indicate that such choices are not made with so great a degree of difficulty.

Other novel types of motivation also occurred from time to time during this period in the experiments. Our research did not provide sufficient instances of each type for us to be able to draw any general conclusions, but a possibly interesting line of investigation into the processes of motivation seems to be opened up by this method of introducing new influences on motivation into the reaction period. We had cases in which curiosity and conviction about an alternative of indifferent value gave rise to opposing tendencies. Opinion as to the pleasantness or unpleasantness of a "new" alternative and conviction as to the indifferent value of the other conflicted in much the same way. As the "new" tastes became partially evaluated in the course of the experiments, "new" alternatives at different stages of evaluation were presented together. This introduced opinion and curiosity into the same choice, and provided opportunity for tracing the development and strength of the desire or aversion arising

according to the degree of strength of the opinion, and its positive or negative hedonic character. Two opinions of similar or different strength and hedonic quality also motivated the choice in certain instances.

As we have said, this method was originally introduced to arrest development of habitual choosing, and to create conditions for "difficult" choice at a period at which our subjects were beginning to find a consciousness of "Self," and "Self-activity" introspectible elements in volitional consciousness. Incidentally, it appears to have opened up a new line of experimental research into motivation. Given more instances of each of these types of motivation, interesting general conclusions might be established.

Development of Emotion during Motivation.

The absence of emotion during the reaction period has been previously noted in another connexion. When we examine the motivation, the reason for the absence of fully developed emotion in the choice is made clear. True emotion develops on the perceptual level. All writers on the subject appear to agree that primitive emotions are aroused only by the presentation of an appropriate stimulus, which stimulus may be original or substitute, but must always be present. My fear, with its well-defined bodily commotion, is aroused because of a specific stimulus which is here and now present; in the same way, all the other primitive emotions presuppose the perception or recall of some definite object or situation.

The distinction between the immediate experience of emotion and knowledge about our past states of emotion must here be emphasised. The contemplation of terrifying objects in general would involve an objective knowledge of the emotion they are calculated to arouse; knowledge of individual experiences of such emotion would probably be revived; but the state of consciousness in these cases is very different from the subjective state involving awareness of somatic changes, which, we believe, constitutes the fully developed emotion. At the end of Experiment 75, out of a total of 313, subject A. made the following observation, *after* he had dictated his introspection:

"I have seldom reported affective states because they were not found as actual affective states. One finds hedonic values of the nature of knowledge; judgments that one is more pleasant; thoughts about pleasantness; but I don't find frequently any actual affective states."

And again in Experiment 193, this subject stated:

"I can distinguish no affective factors, though there is a knowledge of the pleasantness or unpleasantness of the alternatives."

On the other hand, true emotion is not experienced when the mental processes occurring are mainly on the conceptual level. In such processes the mind is working among universals; and abstract ideas do not seem to act as appropriate stimuli for primary emotions.

An examination of the reports given in our introspections shows that the major part of the motivation takes place mainly on the conceptual, not the sensorial level. E.g.:

A. 9. "Very little absolute value to either: both classed as unpleasant."

A. 38. "*Zir* quite prominent, but in a substitute sort of fashion as 'the nicer of the two.'"

A. 65. "I knew it as a 'very pleasant one' but I had not got its real value at all."

A. 103. "The meaning *Jor* was confused: it meant something 'rather nice.' *Tauk* had little meaning. Suddenly *Tauk* developed quite a brilliant meaning; 'something extremely nice.'"[1]

This is very striking during that period of the experiments when opinion and curiosity were introduced into the motivation period. In all the introspective reports, but especially in those given during this period, Aristotle's distinction between the sensory or organic appetite and the rational will is clearly shown. The deliberation is carried on with reference to the general idea of "good," "duty," etc., and it ends in a practical judgment, "this is to be preferred." The values out of which motivation develops are given primarily in the two alternatives. These are of course two definite concrete tastes but the introspections make it clear that, normally, the values entering into motivation are not attached to the particular tastes given, but are subsumed under a universal category—"good," for example[2]. When discussing Development of Meaning, we noted that a stage was reached when meaning developed on the conceptual level and when the words presenting the alternatives came to function as universals, after the manner of ordinary language words[3].

[1] See also introspections quoted on p. 53.

[2] "It is always the object of desire that excites action, and this is either the good or the apparent good...."—*de Anima*, III, 10, tr. by Hicks.

[3] See p. 54.

The fact that evaluation and motivation take place mainly on the conceptual level is supported by evidence coming from cases of choice in which a new value grew up around one of the alternatives. For one of the subjects, *Mep*, the lowest taste-value, came temporarily to possess a high positive value on account of an ethical motive which developed for taking the unpleasant. We have already discussed the occurrence of this motive. The point that here concerns us is the fact that such a motive could only develop on the conceptual level, and by reference to abstract general ideas of "good" and "duty."

During deliberation the concrete sensory taste-values seldom enter into the discussion. It is clear that a given motive comes to be preferred, not because of a prompting of the organic appetite to take, for example, the concrete *Ziv* because of its smooth, pleasant taste, but because the value of *Ziv* has been represented during the motivation as "good," etc.

The absence during the motivation period of any concrete stimulus capable of arousing emotion seems, then, to account adequately for the failure of our subjects to report any.

(5) THE INTERMEDIARY PERIOD.

After evaluation of the two alternatives and discussion of motives, one of them is usually found to possess a higher degree of value. Motivation normally ceases at this point, and yet decision does not always immediately follow. Our protocols show that between motivation and the termination of the act of choice in the determination of an alternative, a striking change in the character of consciousness occurs.

Although they were struck by it early in the experiments our subjects could not at first analyse the nature of this change. It was quite usual at this point in the research for subjects to report it as a "blank." They felt that between the motivation and the decision there was a period apparently empty of content. E.g.:

A. 27. "A sort of hitch. I think a blank. Then 'yes' auditorily with 'inverted comma' feeling with reference to *Ziv*."

B. 76. "At the moment of reaction my mind seemed quite blank of cognitive content."

E. 34. "There seemed to be a considerable blank." (26) "*Mep* chosen after a blank." (29) "Could catch nothing between the pronunciation of the words 'I'll try *Jor* this time,' and the drinking."

F. 39. "A pause. Seemed almost empty, with a searching for confirmation."

D. 58. "Then the words '*Tauk, Mep*' went out with great suddenness when I made the choice."

It was noticed that all the objective contents which had previously occupied consciousness during deliberation, sank abruptly out of awareness. Motives had developed, and yet decision was suspended. Thus, at about the same period in the course of the experiments an "inhibition" or "arrest" was frequently reported in connexion with

this change in consciousness which subjects found so difficult to describe. E.g.:

A. 13. "Sort of arrest of everything, felt helpless."

A. 27. "A knowledge that things were held up. Then chose *Mep*, designating it. Conscious of strong changes in breathing and almost physical nausea."

A. 308. "Mind was simply held up until these words came—'Well, I will.'"

A. 55. "There was a very hazy period; I think a blank; am not quite certain of it: a sort of stoppage of the process."

F. 42. "A pause. Then something that amounted to 'That's the one.'"

As introspection continued day after day, all the subjects became increasingly dissatisfied with the term "blank" as characterising this period. E.g.:

A. 283. "There was a blank, but I don't think this properly describes it."

E. 26. "Nothing present to consciousness, but a lot going on."

D. 32. "There is something in the choice I am missing."

Gradually, after numerous observations, our subjects were able to catch factors which at first had escaped notice, and to describe the period more satisfactorily. As a result of these introspective details, we are now able to advance the following account of the matter. It appears that at this moment, the direction of consciousness undergoes an abrupt transition. Experience which has been predominantly cognitive during the discussion of the motives, gives place suddenly to experience of a conative character, and decision takes place. E.g.:

A. 283. "There was a blank, but I don't think this properly describes it. It is the alteration of objective to subjective process."

A. 61. "There was little blank between the development of the values of motivation and the actual intending of *Tauk*. At any rate, if no blank, there was an abrupt cessation of the previous processes, and a total break in direction of consciousness."

This abrupt transition sometimes gives the subject an impression that the processes of consciousness continue on quite a different level. E.g.:

D. 36. "A sort of change in consciousness came in there. (When recognition had passed.) There seemed a sudden entire change. At this time my mind seemed to cease to operate intellectually. There was a sudden fall away to a different plane of consciousness. I can feel there is a difference between these two states but I cannot tell you what it is. It does not seem to involve any cognitive element at all. It is not something merely passive, and it is not a blank." (76) "After the tastes had gone out of the field I seemed to be carried in a certain direction. Conscious of that change of level I spoke of, the drop from the cognitive stage, to the stage where I experience a feeling of motion."

While then, we agree with Michotte[1] that there is a complete arrest of the imaginal contents of consciousness at this point, our data have enabled us to analyse the nature of this change in the character of consciousness more completely. Our introspections show that the "change," the "blank," the "arrest" is really a transition between two phases in conscious experience, one in which consciousness is occupied predominantly by objective contents, the other in which changes in the subjective state enter consciousness as an enhanced experience of action. The contents of the former are easy to report. The items are normally clear and vivid, and are similar to those objective contents which occupy consciousness in everyday life. In the latter on the contrary it is difficult even to "catch" anything at first, and still more difficult to describe it adequately. The items are hazy and vague, so unlike the usual objective contents that it is only after making numerous introspections under experimental conditions that they take on any degree of determinateness for the subject. E.g.:

D. 32. "There is something in the choice I am missing. While I was making the determination, something was going on in consciousness. I don't know what. I don't think it was cognitive (objective). It is so hazy, I can't catch what it is."

D. 34. "I don't recognise the feeling clearly enough to put it into words. Have not experienced anything like it before consciously."

The period *after* this moment of transition is one which must be very carefully analysed. The marked change in the predominant character of consciousness observable at this moment, appears to be in intimate relation with production of determination of an alternative, since decision which was up to this point suspended, accompanies these changes in the subjective state.

It must be remembered that our principal aim throughout the

[1] It may be useful here to summarise Michotte's analysis of this "Intermediary" period. It is an interval of time, more or less long, during which there is complete arrest of the imaginal contents of consciousness. It is marked by a characteristic subjective state in which the following factors can be observed:

(1) A consciousness of doubt, hesitation, oscillation; a consciousness of waiting and suspense.

(2) General muscular tension localised specially in the reacting finger, and in the chest. Respiration is shallower, accelerated, and the pneumograph curve reveals plateaux.

Concurrently with this, certain objective contents are found:

(1) Frequently the alternatives are present, verbally or intentionally. If one alternative only is present, it is always the one that has been favoured during the discussion of motives. Often it appears with an interrogative significance.

(2) Instruction may reappear in an intentional form.

(3) Sometimes notions, judgments, or items of knowledge having reference to the motivation are present, e.g. "This is the one to take." More rarely, judgment of comparative value appears, e.g. "This is better than the other" (*Le Choix Volontaire*, p. 180).

research has been to discover factors in consciousness which appear to be peculiar to volitional processes. We wish to ascertain from the introspections given whether any correlation is indicated between the experiences they report and the volitional character of the whole process.

The introspections already quoted indicate that experience after the moment of transition is conative in character. The essential similarity of the reports, in spite of their differences of expression and language, makes it clear that the subjects were struggling to express their awareness of experience of this nature. Sometimes they merely chose terms which express the dynamic aspect of consciousness at the moment. E.g.:

A. 31. "A sort of swing of the mind from *Laip* to *Ziv*, which was determined."

B. 3. "The choosing of *Mep* seemed like aiming a dart to hit it."

B. 4. "I seemed to jump upon the other alternative."

C. 13. "There was then a movement from *Jor* to *Tauk*. A mental movement, but I am not sure if it was accompanied by eye movements."

D. 18. "Took *Ziv* with precipitation; made a mental jump to get it."

D. 34. "There seemed to be a sort of mental reaching out to this (*Ziv*), corresponding to the putting out of the hand. I can't formulate it; not exactly a striving but a stretching out for the object. Have not experienced anything like it before consciously."

A. 207. "A mental swing in direction of *Tauk*. Very fast. This was not eye-movement."

Some subjects reported this awareness of conative activity as an intentional or mental direction. E.g.:

D. 111. "A slight and hazy feeling of moving away from something which seemed to be indistinct on the opposite side of the field."

A. 35. "A determination of *Vab* with a consciousness of intentional direction."

A. 37. "I just determined on *Klum*: there was an intentional direction towards it."

A. 48. "The word 'yes' auditorily and kinaesthetically present with the intentional direction to *Tauk*."

B. 10. "I could distinguish a sort of mental movement towards *Tauk*."

B. 11. "A mental swing back to *Mep* which was designated with fragments of auditory imagery."

D. 46. "Seemed a mental movement towards *Tauk*. A mental leap to the thing on the edge of consciousness."

Sometimes it was merely expressed as a movement of attention. E.g.:

A. 85. "Quick change of direction of attention and I actually drank *Ziv*."

B. 13. "A swing of attention with a feeling of activity towards *Mep*."

B. 60. "Rejection of *Jor* and immediate swing of attention to *Ziv* and designation of it."

C. 12. "Then I had the thought, 'I'll turn my attention to the other one.'"

C. 22. "Attention rested on *Vab*, but as soon as I realised its meaning attention swung to *Tauk* which I drank."

F. 31. "Slight movement of the eyes, with a movement of attention. Eyes and attention back to *Laip* which was taken."

Three of the subjects, familiar with previous work on volition, after a few attempts to find expressions of their own for this phenomenon, definitely identified it with the "consciousness of action" reported by Michotte and Prüm, and from that point on in the experiments used that term. E.g.:

A. 35. "This consciousness of action seemed to be similar to or identical with the intentional direction just mentioned."

A. 38. "Intentional direction is the same thing as consciousness of action."

A. 81. "I think this intentional direction is the consciousness of action."

A. 36. "An intentional direction—which itself is a consciousness of action—to *Tauk*."

The other subjects (three) did not adopt this form of expression during the research, but all agree in describing the content of consciousness in question as a dynamic state constituting direction of attention. After the experimentation was complete these subjects were asked whether the term "consciousness of action" expressed the experience that they had been trying to characterise. Two subjects (C. and E.) immediately seized the expression as one they had been trying to invent. The other subject (F.) was diffident over adopting it on account of the difficulty he had in recognising it in the passive form in which it chiefly appeared in his choices[1]. Our subjects seem therefore to have had a common experience at this point in the experiment—the experience of "action." There seems to be no doubt that this was similar to the experience reported by Michotte's subjects under the term "consciousness of action." When it appears it is preceded by abrupt transition in the course of consciousness, all the cognitive elements of deliberation seeming to drop away—a wave of conational experience surging up, and the feeling of "Self-activity" filling consciousness to the relative exclusion of everything else. E.g.:

A. 286. "Eye-movements and very considerable muscular strain. Felt reaction would never end. Then with sudden consciousness of action,

[1] Michotte states that consciousness of action or intentional direction can appear in both active and passive forms, consciousness of tending towards, and consciousness of being drawn towards.

relaxation of all this tension, and a quite clear reference to self, I suddenly reacted shouting out the words, 'I can't choose.' Here the transition from tension, confusion, and very imaginal consciousness to a clear consciousness of action was very marked."

A. 255. "*Wux* quite prominent as a syllable, but had no hedonic meaning. *Ziv* more faintly present but had clear significance. There was a quick flash towards *Ziv*. A clear consciousness of action. There was just *Ziv* and this consciousness of action."

B. 69. "I chose *Rit* on the strength of this belief (strong belief it was water) and from the desire to make certain about it. *Laip* was entirely marginal. At the choice of *Rit* there was momentary consciousness of action. This momentary consciousness of action seemed to envelop the whole of consciousness. All cognitive contents dropped away for a moment. The first cognitive content which I recognised as first to reappear was recognition that I had the glass *Rit* in my hand."

D. 84. "Both (alternatives) then went out of consciousness. I am just 'going,' 'taking,' that's all. Not going to or taking any definite thing. There does not seem to be a single cognitive element left." (86) "Had a feeling only that I was 'going,' 'taking.' Just that I was 'going' to take. This feeling was very strong. *Ziv* was not there as an object. Went out of consciousness like a flash. Nothing in consciousness but this consciousness of action. Not only that I was 'taking' it, but that I was 'going' to take it. As if I was being carried or drawn." (61) "Strong feeling of motion to *Ziv* but not as a distinct object. Just a consciousness of motion." (62) "Strong sense of being drawn in a direction to an object. A motion in a certain direction. Direction only definite. Nothing in consciousness at the end." (71) "A pronounced and definite feeling, but the motion seemed slow: nothing present but this consciousness of motion." (85) "The feeling of being carried along which I have reported is a metaphor. Consciousness of action expresses it better I think after all." (110) "Chose it with a hasty mental movement. Pronounced consciousness of action. Direction of motion towards this exceedingly hazy thing."

C. 102. "There certainly was a feeling of alertness at the decision."

Although these quotations indicate that consciousness is relatively bare of introspectively observable objective content after the moment of transition, nevertheless, one other very important item comes into awareness. Consciousness of action involves an immediate knowledge of the "Self" which is active. The subject has an awareness of himself as the experiencer, the doer, the sufferer. He cannot become aware of action in a detached and abstract manner; the experience has a peculiar warmth and intimacy for him; he is only conscious of action at all because he has an immediate intuition of the "Self" as active—striving, resolving, designating, choosing, etc. E.g.:

A. 303. "Second pronunciation of *Ziv* was accompanied by a quite formless reference to self, with distinct muscle feels somewhere in the thorax. A quite clear consciousness of action."

A. 304. "Hesitation. Repetition of *Suj-Zul* with eye-movements. *Suj* rejected, and *Zul* intended as the least unpleasant, with clear consciousness of action, and a knowledge that the self was involved. No sensorial contents here."

B. 41. "A clear knowledge I was taking something I did not like."

D. 47. "It is only in consciousness dimly as the thing I am going to. I seem to traverse the conscious field. I seem to clutch for the desirable object."[1]

We believe this to be an immediate awareness or intuition of "Self" as it is given in the act of choosing. This consciousness of "Self" is lived directly, and forms part of the total experience in the cases in which it occurs. It arises from experience and tends to come into awareness in the same way as any other lived experience[2]; and it is reported, when the introspection is dictated, as are other items of awareness. It seems probable that the cases in which the subject uses the expressions "I," "Self," truly report the facts—as in "I was conscious that I did so and so"—and mean literally that the "Self" was conscious of Self-doing-so-and-so. This immediate awareness of Self is not at all like our abstract concept of the Self; neither does it seem to tally with the sensory percept[3]. It is merely the "Self-as-willing," when it wills; the "Self-as-resolving," when it resolves; it does not in fact seem to be the self as we ordinarily think of it in everyday life.

We have shown in this section that between motivation and the decision there is a period when there is a noticeable transition in the course of consciousness; and that in this period, two important items come into awareness:

(1) Consciousness of action.

(2) Consciousness of "Self," i.e., the self which is active.

The evidence for these items of awareness will be fully developed in subsequent chapters.

(6) THE FINAL STATE.

We now pass to a consideration of the act of will by which the processes unfolding under the influence of the determining tendency are terminated.

According to the subjective impression of those subjects who sat for our experiments this termination may be voluntary or non-

[1] See also chapter VI, p. 136.

[2] Spearman, *Nature of Intelligence and the Principles of Cognition*, 1st Principle, p. 74.

[3] We hope to show in the next chapter that it is clearly distinguished by our subjects from the sensorial elements entering into the percept of the bodily self during the experiments (see p. 122).

voluntary. Our subjects frequently stated that they felt the choice to be "very voluntary," "truly voluntary," "passive," "mechanical," "habitual," "quite automatic," "the result of a set." Though such judgments on the nature of the choice enter into the reports on which our conclusions with regard to this stage are drawn, we must not be led by them to conclude as to any real voluntariness. We recognise that, because of the experimental method of our research, we are limited to the analysis and classification of volitional phenomena, and to problems concerned with structural details of the process of choosing[1].

Forms of Choice.

Our task will, therefore, be to examine both introspective reports and objective records for indications of specific structural similarity or difference between choices which leave the subject with the impression that the process has been truly volitional, passive, habitual or automatic. In this investigation, we took as our starting-point facts concerning the classification of forms of choice already established under experimental conditions of research. We refer in particular to the analysis made by Michotte and Prüm in *Le Choix Volontaire*. These investigators found well-defined structural differences between two distinct forms of voluntary choice, DECISION and CONSENT.

Decision.

Choice, they state, is considered to be a true decision when it terminates immediately after the motives have developed, immediately after the "pause" in which feelings of doubt and waiting arise; or immediately after the *two* alternatives become present to consciousness intentionally or with inner pronunciation. In such cases the favoured alternative is designated or fixed with a characteristic mental gesture taking the form of an intention or consciousness of direction.

Decision, they find, is reported as "cold" or "lively" ("froide," or "vive"). It was found to be "lively" when it was preceded by a state of strong muscular tension; if no muscular tension was observable the decision was described as "cold." Unpractised subjects felt this to be a significant distinction with regard to the voluntariness of the choice. With further practice, however, the

[1] We have no concern in this research with the questions of causality, free will or determinism, although we recognise that the empirical data presented in such researches form the starting point of all ultimate philosophical discussion.

distinction lost its significance, more complete analysis of the introspection period revealing the fact that muscular tension and "lively" choice were intimately related to states of bad adaptation of the subject.

The mental direction accompanying the decision Michotte and Prüm found to be of both active and passive character. It may and more commonly does take the form of an active tending towards the object of choice; or again, it may take the form of being drawn towards the favoured alternative.

Consent.

Consent, on the other hand, depends on the presence of the favoured alternative *alone* in the focus of consciousness immediately before the termination of the process. This presentation often takes an interrogative form and may be accompanied by the notion, "This is the one one must take." The authors point out that the fact that the presence of the favoured alternative *alone* in consciousness conditions a Consent and not a Decision, can be well understood. The alternative about to be selected is already present to consciousness; therefore the phenomena characteristic of Decision, the mental gesture, the intention, etc., need no longer be made—adhesion or acceptance will suffice. One of Michotte's subjects stated the difference thus: "La décision est 'ce sera cela' le consent, 'eh bien, soit.'" The authors state that the character of the Consent type is intimately connected with the motivation. The mark of Consent—the presence of the favoured alternative alone at the moment of choice—is itself only produced in certain well-defined conditions, viz. when the subject is confronted by equivalent motives and passes several times from one to the other. As it is just in this respect that we fail to fit our data into the existing scheme of classification, we give Michotte and Prüm's statement as it stands[1].

In distinction to Decision and Consent as types of voluntary choice, Michotte and Prüm find a third type, non-voluntary choice. In these cases the subject fails to find any consciousness of action. They therefore conclude that the presence or absence of consciousness

[1] "Si le consentement dépend immédiatement de la présence au moment du choix, de l'alternative favorisée, cette présence même ne se produit que dans des conditions bien déterminées, quand les alternatives devant lesquelles se trouve le sujet se contrebalancent plus ou moins au point de vue de leur 'valeur.' Cette équivalence des alternatives doit donc être considérée comme la cause éloignée du consentement"—*Le Choix Volontaire*, p. 191.

of action may be taken as the structural characteristic distinguishing voluntary from non-voluntary processes[1].

Among our experimental choices we find both Decision and Consent types of choice. The following quotations clearly show the structural characteristics of Decision:

D. 46. *Laip-Tauk.* "Recognised words immediately. *Laip* more distinct than *Tauk*. Recognised *Tauk* as agreeable immediately, and then it sank back and became very indistinct. Very pronounced consciousness of action here. Seemed to be a mental movement towards *Tauk*. A mental leap to the thing on the edge of consciousness. The movement seemed to be from the centre to right. Whole operation exceedingly fast. A sort of mental flash."

A. 61. *Tauk-Zul.* "...With an extraordinarily vivid mental alertness. *Tauk* was intended; quite strong consciousness of intentional direction and action. At this moment *Zul* was in the background. In physiological terms it can well be described 'like the crack of a whip.' A little blank between the development of the values of the motivation period and this actual intending of *Tauk*. At any rate, if no blank, there was an abrupt cessation of the previous process and a total break in the direction of consciousness." (94) *Vab-Zul.* "...I dwelt on *Vab* looking at it. It developed progressively as more and more unpleasant. Then, quite suddenly, though I seemed to have the knowledge I could do it, I swung round, and with some consciousness of action, and intentional direction, chose *Zul*. In first part of the reaction there was a certain amount of strain and unpleasure, and I think muscular effort. After swing away from *Vab* the muscular tension ceased."

B. 4. *Klum-Laip.* "...For a moment I did not see the other one for consciousness seemed filled with the meaning of *Laip*....During this time I think I was conscious that the other alternative was a four-letter word, but I am sure I did not know what it was. I seemed to jump upon the other alternative."

D. 61. *Ziv-Mep.* "...Attention shifted to *Mep* to bring it fully into consciousness. Without referring to *Ziv* again both words faded out of consciousness. Strong feeling of motion to *Ziv*."

The difference between the two types can be seen by comparing the quotations just given with these examples of Consent:

A. 16. *Laip-Mep.* "...Meaning of *Mep* strongly present in consciousness: and with the auditory and kinaesthetic presence of *Mep*, I accepted it. *Laip* was then out of consciousness."

A. 26. *Laip-Tauk.* "The sound *Laip-Tauk* shot into consciousness with the relative pleasure value. Knowledge that I liked *Tauk*. The word 'Yes' auditorily with reference to *Tauk*. 'Yes' seemed to be in inverted commas.

[1] "D'autre part, il existe des processus qui paraissent être tout à fait semblables à nos décisions volontaires et qui cependant ne sont pas considérés comme tels par le sujet; ce sont les décisions automatiques. Le seul facteur qui dans ces cas est toujours absent, est la conscience d'action"—*Le Choix Volontaire*, p. 195.

At that moment *Laip* was in the background. It was an assent to *Tauk*, rather than determination of it."

A. 89. *Ziv-Tauk.* "A state of mind equivalent to 'Let it be *Tauk*,' with the knowledge you said you liked *Tauk* best. Sort of 'laisser aller' feeling *Tauk* was good enough. A consciousness of passion: of being drawn towards."

A. 300. *Mep-Zul.* "At the last pronunciation of *Mep* a rational attitude on my part equivalent to 'Well let it go.'"

B. 85. *Laip-Vab.* "Some confusion. *Vab* certainly did not develop its full meaning, but sufficient to provide a negative motive. Swing of attention to *Laip* with the feeling, 'Well, this is good enough.'"

D. 73. *Mep-Jor.* "Recognised *Mep.* Friendly feeling. Visceral warmth. Felt inclined to take it. Swung over to *Jor.* Recognised it as an indifferent taste. Changed mind about *Mep.* Took *Jor* with a feeling it does not make any difference."

After examination of all the data of our research, however, we are left with the impression that these types are not so clear cut as the authors of the *Le Choix Volontaire* found them to be. Many of the reports dictated cannot be fitted into either type. This may be due to one or both of the following causes:

(1) Owing to a failure on the part of our subjects to report all the structural details on which the classification is made.

(2) Owing to the fact that Decision and Consent types shade off one into the other and that there are frequent borderline cases showing certain characteristics of both Decision and Consent.

With regard to (1) we have to note that it is very uncommon for all the details of the introspection period to be accurately reported in the early experiments. New subjects are at first occupied in catching all the processes entering into recognition of the alternatives and motivation. It is only after a certain amount of practice that the very fleeting and subjective processes concerned with the production of the choice proper are sufficiently isolated for there to be some report of them. The reports of subjects E. and F. in particular are very objective. In many of the experiments, after dictating a detailed account of the processes of recognition and motivation, nothing is reported of this stage of the choice beyond "Reacted and drank *Klum*," "Took *Ziv*," etc.

With regard to (2) we have several observations to record. In the first place we find that the intentional direction, the mental gesture (indicating an alternative not at the moment present to consciousness), is frequently present in typical cases of Consent. The alternative about to be favoured, or some presentation of its value appears alone

in the focus of consciousness immediately before its fixation by Consent, and yet a mental direction towards it is definitely reported. We have already noted that Michotte and Prüm state that in cases of Consent, intentional direction is unnecessary, and therefore fails to appear. The following examples show that in our research cases of intentional directions *did* appear in Consent type:

A. 68. *Jor-Mep.* "*Jor,* with very little meaning: *Mep,* as decidedly unpleasant. Slight hesitation. Then *Jor* repeated very faintly, auditorily and with a consciousness of action;—what I have before called an intentional direction."

A. 64. *Mep-Laip.* "...Then *Mep,* more prominent, and a clear knowledge that it was much the most unpleasant. *Laip* not then in consciousness. Then faintly, auditorily, *Laip,* and an acceptation of it in a vigorous mental gesture."

D. 47. *Mep-Ziv.* "Saw both as words first. Suddenly *Ziv* became the centre of the field. *Mep* seemed to fade. A friendly feeling, warmth, glow; took it (*Ziv*) with a certain visceral feeling, and a mental satisfaction over the choice. A consciousness of action—very fast—I seemed to clutch for the desirable object."

A. 7. *Ziv-Zul.* "Mental turning away from *Zul,* and a feeling of being drawn to *Ziv.* Momentary hesitation and a mental state equivalent to, 'Oh, well, I know perfectly well that I'm choosing *Ziv* because I like it, but after all why not?' Then with a feeling of triumph *Ziv* was accepted with consciousness of action."

C. 13. *Jor-Tauk.* "There was then a movement from *Jor* to *Tauk.* A mental movement, but am not sure if it was accompanied by eye-movements. *Tauk* seemed to grow in the visual focus of attention. Then became aware it was one of the most pleasant in the whole series. Reacted and drank *Tauk.*"

D. 89. *Vab-Klum.* "Some difficulty in recognising both tastes. *Klum* a little disagreeable. I found myself saying, 'I wish there was some other taste to take.' Was saying this while I was making the mental journey after *Klum.*"

Michotte and Prüm did in fact make a passing reference to these "midway" cases in which the subject considers the case to be intermediate between Decision and Consent; but we feel, after examination of our protocols, that cases such as this are more frequent than these authors indicated.

In the second place, we cannot find clear indication of the relation which is said to exist between the Consent type and equivalence of motives during the period of deliberation. Undoubtedly deliberation of this type does lead finally to the predominance of one of the alternatives in consciousness immediately before the choice. Three of our

subjects indeed consciously adopted this as a device for terminating such cases of difficult choice[1].

We should, however, describe the actual "fixation" in these cases as a Decision, not a Consent. The words used indicate a distinct and vigorous "willing" of the alternative rather than acceptance, adhesion or assent. The mental gesture is particularly strong in such cases and is reported in very emphatic terms. In the light of the reports at our disposal we consider that some of our most marked cases of Decision occur after hesitation between equivalent motives. We are therefore of the opinion that mental gestures and intentional directions are not exclusively the phenomena of the Decision type, but that they may appear sometimes in a very strong, sometimes only in a weak form in the Consent type also. The intentional direction is

Table XVI. Average percentage fall in resistance, and average reaction times for different forms of choice.

NOTE. This classification extends over the period during which "new" alternatives were introduced.

Subject	"Decision"		"Consent"		All forms		"Habitual"	
	1	2	3	4	5	6	7	8
	Av. R.T.	Av. % fall	Av. R.T.	Av. % fall	Av. R.T.	Av. % fall	Av. R.T.	Av. % fall
A.	1020	4·04	1892	2·06	1653	3·06	1243	1·76
B.	3493	4·35	5612	3·0	4022	3·49	3208	2·15
C.	2287	8·5	2985	4·75	3071	5·95	2125	2·48
D.	1564	2·04	1385	0·9	1459	1·25	1450	0·42
F.	3039	3·9*	2776	5·0*	1298	3·7	Not classified	

* Individual difference.

a consciousness of self-activity, and involves awareness of the "Self" concentrating its conative energy in a certain direction. It *is* the "consciousness of action." It will be remembered that Michotte and Prüm place consciousness of action as the phenomenon proper to voluntary choice. Therefore, as these authors consider Consent to be a type of voluntary choice, it is quite consistent that our subjects should very frequently report these mental directions. If Michotte and Prüm found consciousness of action at all in Consent types, and we assume that they did for Consent to be included in types of voluntary choice, it is difficult to see how or where else it could appear

[1] See "Motive Strengthening by Degree of Consciousness," p. 88.

save in some sort of mental direction or gesture at the termination of the choice processes. Our own opinion is that mental directions appear unquestionably in Decision; that they frequently appear when Consent terminates a difficult choice; and that they appear in a weak form in ordinary types of Consent.

Having found however that our research in the main corroborated the results of Michotte and Prüm with respect to the classification of forms of choice, we then turned to the objective records obtained during the choices. In compiling Table XVI, only clear cases of Decision and Consent have been classified; doubtful cases have not been included. In the first place it will be noticed that the average reaction times for Decision and Consent corroborate the results of Michotte and Prüm. Average reaction times are quoted in *Le Choix Volontaire* for one of the subjects, and show that the average reaction time for Consent is longer than for Decision[1]. It will be seen that the same holds good for three of our subjects, A., B., and C. This result is of no particular importance in itself. The reason for it is obvious and has already been established by Michotte and Prüm. It is of indirect importance, however, in that it indicates that we have classified our choices by the same criteria as the other investigators, and thus increases the significance of the new objective data we present. The average percentage fall in resistance was then calculated for each type of choice. It will be seen that there is a marked consistency in these results for all our choices[2]. The average percentage fall in the cases of Decision is higher than the average percentage fall in all types, and that of Consent lower.

In the light of the facts we have already established with regard to the relation between the magnitude of the deflection and the amount of conative effort in the choice, these results seem interesting. It is clearly indicated by the figures and corroborated by the introspective reports that Decision is an altogether more vigorous process than Consent. The reports reveal the fact that in Decision there is a rapid but strong direction of Self-activity at the moment of choice; and the psycho-galvanic records consistently corroborate this. Consent is felt to be a less vigorous process, although a true choice. There

[1] See *Le Choix Volontaire*, p. 277.

General average	2166 sigma	Subject M.
Decisions	2117	
Consents	2806	

[2] As we have previously noted, these results are given in crude averages. They have not been submitted to any further statistical manipulation, and are, therefore, only meant to be the roughest mathematical indication of a general tendency.

is however no sudden surging up of Self-activity; the process is passive and marked by calm acceptance and a feeling of "letting the thing go"—a different experience entirely from that which comes in active designation.

It is of interest to note in connexion with this point that cases of consent which end with a vigorous mental direction to the alternative in consciousness have a greater percentage fall in resistance than the subject's general average given in column 6, Table XVI. E.g.:

	%		%
A. No. 64	5·6	B. No. 24	6·6
A. No. 123	7·1	D. No. 47	2·3
A. No. 302	5·1	C. No. 13	8·2

"Automatic" Choices.

If we next examine the percentage falls in resistance for the choices called "automatic" or "habitual," it will be seen that the average fall for each subject is invariably lower than it is for the Consent type of choice. In fact the average percentage falls in resistance for each subject show a steady decrease as we pass from the Decision to the Habitual type of choice. Decisions are marked by great conative activity and strong consciousness of action; Consents have a passive and "laisser-aller" character; while Habitual choices are reported as being made with so little effort on the part of the subject as to lead him sometimes to report them as "automatic."

This brings us to the question as to whether we ever get, in choice experiments of this kind, an entirely automatic choice. Automatic choice may be taken to be the theoretically limiting case of a progression from Decision through Consent to Habitual Choice; but we have to note that choices such as those investigated in these experiments were carried out by the co-ordination of two acts of will:

(1) made at the acceptance of the task and bearing on the eventual realisation;

(2) establishing the selection of an alternative[1].

But this co-ordination, Michotte points out, does not make the voluntary character of the second act depend on that of the first; either one or the other may be replaced by involuntary phenomena. He writes in *Le Choix Volontaire*, pp. 226–7:

[1] "La réalisation de l'alternative choisie dépend d'un acte de volonté distinct de celui qui constitue le choix. Il est évident aussi que ce vouloir peut coïncider avec l'acceptation de la tâche"—A. Michotte, *A propos de Contributions Récentes à la Psychologie de la Volonté*, p. 225.

To say that the realisation depends on the decision accompanying the task does not imply that the volitional character of the selection is conditioned by the pre-formed decision. Automatic choices can be preceded by a decision to realise that which will be chosen....It is the phenomenon of selection which gives the volitional character to a choice, which is in no way attributed to it by reason of its co-ordination with previous volitional phenomena."

We agree in finding that choice is produced by the co-ordination of two acts of will. In our introspections we find reports of consciousness of action both at the decision to perform the task when the given moment arrives, and also at the fixation of an alternative. The question which for us remains more or less undecided is whether the selection of an alternative, which at the commencement of the course of experiments was accompanied by strong consciousness of action, can ultimately become entirely automatic.

There seems to be evidence in our protocols that automatic choice was never reached in our experiments and that so-called "automatic" ought more correctly to be designated as "Habitual." We base this statement on four considerations:

(1) It appears to us that the determining tendency created by the first volitional act in the acceptance of the task is always influencing the selection. No matter how automatic this selection appears, the instruction "Choose for a good reason" is always operative. This "good reason" may only be implicit in a knowledge of which alternative has been previously chosen in the given combination. But this knowledge carries with it a feeling that the "good reason" which was quite explicit in the first deliberations, could in this case be made explicit if necessary, and that the whole process is developing along the right lines. E.g.:

E. 5. *Klum-Laip.* "...I realised I had had this before. Knowledge of previous decision for *Laip.* That was sufficient. 'Good enough before, good enough now.' Took it to save myself trouble." (32) "Got *Zul* as 'sweet.' This had been regarded as sufficient reason for drinking it in the past. Satisfied; drank *Laip.*"

D. 11. *Mep-Tauk.* "Practically equal value. No positive motive for one or the other. I spontaneously took one—*Mep*—but did not feel I had made a mistake."

(2) Again, selection may be just about to terminate along quite "automatic" lines when suddenly there is a very volitional change of direction to the other alternative. E.g.:

A. 175. "Auditorily and kinaesthetically, *Tauk-Ziv*, then *Tauk* again. A feeling that the reaction would end here. Suddenly *Ziv* and its meaning became very present to consciousness. There was a distinct willing of it,

i.e. distinct mental rejection of *Tauk* and a choosing of *Ziv*, with a consciousness of action that was certainly voluntary. If I had stopped at *Tauk* it would have been purely automatic. A feeling of satisfaction."

A. 103. *Jor-Tauk.* "Meaning of *Jor* confused, meant something 'rather nice.' '*Tauk*' had little meaning, and there was the beginning of an intentional direction to *Jor*. Suddenly *Tauk* developed quite a brilliant meaning. Something 'extremely nice.' Quick swing away from *Jor* to *Tauk*, which was designated with consciousness of action and pleasure. I so to speak stopped myself in the middle of choosing *Jor* and switched to *Tauk*."

(3) We believe that the accepted mark of true voluntary choice—the presence of consciousness of action—is also to be found in so-called "automatic" choices; and that only a difference in degree of consciousness of action separates this form of choice from true decision. At first, Habitual choices were reported as "passive," "seemed no active intervention of choosing," "seemed mechanical," etc. Gradually, however, subjects who had isolated consciousness of action in "difficult" choices, now discriminated the same active character in choices similar to those they had been calling habitual and automatic. E.g.:

A. 201. "Am inclined to think this action factor is present in what I have called 'automatic' choices." (182) "*Mep*, like the crack of a whip; rebound from it to the other. Certainly a consciousness of direction; but the reaction I should characterise as 'automatic.'"[1]

(4) The belief that there is only a difference in degree of Self-activity between Decision, Consent, and Habitual forms of choice, receives support from evidence that can be found with regard to the structural development of Habitual choice. It appears clear that the Habitual type develops structurally out of Consent. The typical structure for Consent, it will be remembered, was based on the presence of the favoured alternative alone in the focus of consciousness, just before the termination of the choice, and on an adhesion or consent to this alternative. The typical structure of the Habitual type of choice is very clearly a simplified form of this. E.g.:

Jor with inner pronunciation.
Ziv with inner pronunciation.
Relative value quite clear.
Ziv with inner pronunciation, seemed to be the choice.

Thus, in the Habitual type, the presence alone of the favoured alternative and the adhesion to it have become condensed or fused,

[1] See also chapter v, p. 127.

and the situation is literally as the subject expresses it: the second pronunciation of one of the alternatives constitutes the choice.

These four considerations indicate that the most we can say on this question is that with repetition choice tends to follow habitual lines. It never in our research becomes automatic in the true sense of the word, for the protocols show that at any point what appeared to be habitual was not infrequently broken by a volitional act, and the whole direction of the choice changed.

The Subjective State.

When discussing the Intermediary Period we noted that among the elements observable on introspection was an elusive factor, very difficult to seize and describe. We found that this factor was a consciousness of Self-activity and that it appeared at the moment of the termination of the choice processes. It seemed to be in no way identifiable with the development of perceptual and deliberative processes unfolding under the influence of association and the mental set, but was in the opinion of our subjects, ultimately connected with their impression of the voluntariness of the choice[1]. E.g.:

A. 77. "A designation of *Jor* with consciousness of action; a thought that in previous choices between these I had generally chosen *Laip*. A heightening of its hedonic value by something given it from myself." (103) "Quick swing away from *Jor* to *Tauk*, which was designated with consciousness of action. I so to speak stopped myself in the middle of choosing *Jor* and switched to *Tauk*."

B. 78. "At the moment of reaction there seemed to be a 'blank'; there was a distinct feeling of action and movement filling the whole of consciousness."

The introspections indicate that consciousness of "Self" is an important factor in the production of the selection, and when discussing "Consciousness of Action" and "Self as a phenomenon in Volitional Consciousness" (chapters v and vi) we shall show that it is unlikely that any selection is made without some degree of Self-activity becoming observable on introspection, but that some subjects failed to report it as a special factor side by side with the objective content of the choice on account of its vague and subjective character and momentarily focal appearance. It is usual for consciousness to be comparatively empty of objective contents at the moment of selection. As well as a consciousness of "Self," however, there is

[1] Further examples illustrating the occurrence of this process will be given in the chapter on "Consciousness of Action."

some representation of the object to which the Self has directed its energy—the object of the choice.

The most striking feature about the presence in consciousness of the object of choice is the fact that it loses much of its determinateness—its individual qualities and characteristics—and is presented merely as the "chosen" thing, and the "desired" thing, the "good" thing, the "thing I am going to take." E.g.:

D. 94. "Had a consciousness of very rapid motion. This time there seemed to be some sort of visual image of the thing in the field. Very indistinct; as some definite object at the end of the line of flight. A sort of yellow-brown image. Nothing more definite than this."

D. 34. "This stretching seemed to be for the desired object itself. It had lost all its relativity to *Zul.*"

D. 37. "After making my decision to take one it loses its relative value. It loses also every distinctive note and characteristic. It is only in consciousness dimly as the thing I am going to."

At other times even these attributes disappear, and the chosen alternative is in consciousness merely as an object, but as an object having some sort of spatial relation to the "Self" with which it appears to be orientated. E.g.:

D. 110. "Direction of motion towards this exceedingly hazy thing."

D. 111. "Moving to something which seemed to be indistinct on the opposite side of the field."

D. 38. "Even *Ziv* as such fades. I made a quick rush to it. No visual path, but I seem to go in the direction of 45 degrees N. Not there as desirable or as very desirable, but just as an object."

The examples quoted indicate that when consciousness of action is experienced it involves some sort of representation of the object to which the activity of the "Self" is being directed. We have shown that this object is often very vague, but the following examples show that it can even disappear altogether as a definite object, its influence being felt only in the determination of the direction of the activity. E.g.:

D. 62. "A sense of being drawn in a certain direction. Direction only definite, nothing in consciousness at the end."

D. 86. "*Ziv* quickly faded, even as a definite object. Went out like a flash. As if I were carried or drawn, rather than an active striving."

Wundt's "Emotional" Theory.

When discussing Motivation we noted that Wundt stressed the fact that an act of volition appears invariably to be preceded by a specific development of the feelings. It will be remembered that Wundt takes as fundamental feelings pleasure and its opposite unpleasure, tension and its opposite relaxation, excitement and its opposite depression. The development of these states can be traced in the introspections given in our research, but the classification of all three pairs in the category of "Feeling" does not seem justifiable on what we find reported.

Pleasure and *unpleasure*, we agree, are primitive static affective states. According to the Principles of Cognition[1], all experience whether it be of a cognitive or a conative character tends to emerge into awareness; but this emergence is always coloured by a specific feeling tone. This tone may be of such weak intensity that the pleasure or unpleasure is barely introspectible; or it may be so strongly marked as to lead to the report of definite affective states. As we have mentioned earlier, however, the wording when such reports are given indicates that the nucleus around which all the processes in the total volitional consciousness group themselves is the strong conative "set" created by acceptance of a specific instruction. The reports previously quoted[2] indicate that pleasure and unpleasure appear in awareness as modalities of the development of this conative set. We have in no instance any definite report that affective states exert a controlling influence on the development of conative activity. In addition to the introspective reports already given in this connexion[2], the following quotations will illustrate this point. E.g.:

A. 8. "The whole marked by unpleasure, and a sort of feeling of opposition and annoyance and dislike." (10) "Distinct feeling of relief and pleasure on the designation of *Jor*." (41) "Reacted with a certain amount of pleasantly toned content. I cannot discriminate the pleasure as something separate from it." (288) "Period of suspense. Then with fairly marked consciousness of action, and a reference to self, I reacted with a sense of satisfaction."

B. 19. "The whole process coloured by annoyance and displeasure." (64) "Read *Mep-Klum* twice. Aware that I had two of the old list. Aware of their relative value. Choice of *Klum* with consciousness of action, and a feeling of pleasure and relief that the choice was an easy one."

D. 65. "Chose *Mep* with a peculiar feeling—a comforting sense of sureness in the movement; like going to a person with whom you feel easy, safe

[1] Spearman, *Nature of Intelligence and the Principles of Cognition.*
[2] Chapter III.

comfortable." (61) Strong feeling of motion to *Ziv* but not as a distinct object. Just a consciousness of motion. A rather quiet feeling of satisfaction, also of visceral warmth during that consciousness of action."

Considering the reports as a whole, we find that report of definite affective states is the exception rather than the rule. Some subjects have even reported on their inability to find any introspectible elements of pleasure or unpleasure in the choice. E.g.:

A. 193. "...About the same value. There was a knowledge I needed a serious motive. Eye-movements. *Jor* was recognised as being less unpleasant than *Laip*. An intentional direction towards *Laip* with a consciousness of action. Can distinguish no affective factors, though there is a knowledge of the pleasantness or unpleasantness of the alternatives." (133) "No affective state to be found, but a sort of barrier to further action." (292) "Whole quite deliberate and very calm. Could discriminate no consciousness of action except in the final pronunciation of *Jor*. Cannot find any faintest pleasure or unpleasure in this process of choice."

Tension and *relaxation* are reported by all our subjects especially during "difficult" choice. They are connected with the subjects' cognition of specific physiological changes. A certain degree of muscular strain is always introspectible during experiments such as those carried out in this research; but during "difficult" choices—choices where the normal development of the mental set is inhibited—the muscular strain in eyes, neck, arm, etc., increase in intensity and enter awareness globally as an unpleasurably coloured feeling of strain and tension. The resolution of this tension occurs, as Wundt has stated, very abruptly. The following introspections show that relaxation follows immediately and completely upon the decision to accept one of the alternatives. It is of some interest to note that relaxation appears in awareness immediately after the fleeting moment of consciousness of action constituting the mental direction to the favoured alternative; its appearance in consciousness is not, as we might expect, postponed until the bodily movements of realisation have been executed. E.g.:

A. 286. *Zul-Nep*. "Eye-movements and very considerable muscular strain. Feeling of absolute impotence and confusion. Nothing but *Zul-Nep* as visual, auditory and kinaesthetic images. Then with sudden consciousness of action and relaxation of all this tension I suddenly reacted. Here the transition from tension, confusion, and very imaginal consciousness to relaxation and clear consciousness of action was very marked." (197) *Mep-Suj*. "...Strong state of muscular effort and tension; head trembling. Knowledge I had before in similar choices chosen *Mep* dwelling on it. Dwelt voluntarily on *Mep* which I fixated visually. A consciousness of

intentional direction towards *Mep*. This I think is a consciousness of action. Great physiological strain, suddenly followed by seemingly instant relaxation."

Excitement and *depression* can be analysed from our introspections as being specially connected with the subject's cognition of changes in his conative state. It will be remembered that the term "excitement" was first chosen by our subjects as a suitable term with which to express cognition of experience of a conative character, but that the term "alertness" was finally selected expressing awareness of sudden changes in the conative state occurring at the warning signals[1]. A similar sudden change occurs at the moment of decision, when a consciousness of action or mental direction is reported; and there seems to be no doubt as to the fundamental similarity in the experience leading to report of "alertness" in the one instance, and "consciousness of action" in the other. We feel confident, also, in identifying this phenomenon with Wundt's feeling of excitement. Consciousness of action or alertness at the moment of decision will be fully discussed in the next chapter, when evidence for its occurrence will be given.

With the designation or acceptance of an alternative come the bodily movements of the reaction and the taking of the glass to realise the decision. This constitutes the last link in the chain of conative processes unfolding under the influence of the mental "set" created by the acceptance of the instruction, "Choose and drink one for a serious reason, and react as quickly as possible." By virtue of its correlation with this previous volitional "setting" of conative activity, realisation of the task is normally carried out in an habitual manner. It is the last step in the functioning of the determining tendency; no fresh act of will is necessary to bring it about, and the physiological processes involved in the movements of reaction and realisation are, very frequently, only on the outermost fringe of awareness.

[1] See chapter III.

CHAPTER V

CONSCIOUSNESS OF ACTION

We pointed out in the last section that changes in the conative state occurring after the Motivation period are very difficult to observe introspectively. They are fleeting and very quickly give place to more stable contents of consciousness; they appear totally unlike the more prominent cognitive experiences of every day life; and even when they have become observable on introspection, they cannot always be described satisfactorily by the subject. We are confident in identifying the dynamic experience appearing in awareness at this moment as the "Conscience de l'action" reported by Michotte and Prüm, and the "aktuelle Betätigung" mentioned by Ach[1].

All the details of the experience "Consciousness of action" as we are now able to construct it in a typical process, have only been collected gradually by our subjects, after repeated observations of the content of consciousness during the experimental acts of choice. In practice, the following method was found useful. We have mentioned that, early in the course of the experiments, all our subjects reported the occurrence in consciousness of a process they felt unable to describe. This sometimes gave them the impression that there was something in the choice they were missing. As soon as this was reported the subject was told to observe this point very attentively in the subsequent experiments, care being taken to give no hint of the experience which other subjects had found there. Thus subject D., in Experiment 32, merely made the bare statement "There is something in the choice I am missing." By repeated observations in later experiments he was able to analyse out the process occurring at this moment and to describe it satisfactorily and exactly. In No. 86 he reported, "Made the decision very quickly to take *Ziv*. It then quickly faded from the field, even as a definite object. Had a feeling that I was 'going' 'taking.' Just that I was 'going-to-take.' Nothing in consciousness but this consciousness of action. Not only that I was 'taking' it but that I was 'going-to-take-it.'"

The stages in the gradual characterisation of the experience by this subject are interesting and instructive. The reports in which he was

[1] Michotte was struck by the same similarity between the experience of his own subjects and those of Ach. He writes: "Le 'facteur actuel' de Ach est en effet, sans aucun doute, ce que nous avons appelé 'Conscience de l'action'"—*Le Choix Volontaire*, p. 311.

able to make any addition to his description of the process are quoted in chronological order in the appendix[1].

In criticism of those experimenters who find in volitional consciousness a consciousness of Self-activity and consciousness of willing, Wheeler[2] has urged that these phenomena are of the nature of inferences or constructs from the true phenomena. In his opinion the basal and organic contents giving rise to consciousness of action are kinaesthetic sensations and images. He states that practised introspectionists can analyse the construct into these elements, and find nothing over and above them in volitional consciousness. Against this criticism we observe in the first place that consciousness of action is distinct and different from the kinaesthetic and organic sensations which are often present together with it and discriminated from it. Examination of the introspections in chronological order shows that experience which in the first experiments is a vague and more or less undifferentiated complex of muscular effort, kinaesthetic sensations, organic sensations, and consciousness of action, gradually becomes analysed into these distinct elements. The reports show that differentiation becomes detailed and minute, and that subjects emphasise the fact that consciousness of action appears to them to be of a radically different nature from awareness of kinaesthetic sensations, visceral sensations, muscular strain and effort, and changes in respiration and pulse rate which may or may not accompany it[3]. E.g.:

A. 255. "A thought towards choosing *Ler*, because I wanted to know what it tasted like. Then with marked consciousness of action and considerable muscular strain, pronunciation of the words, 'I will.'" (257) "Eye-movements, and strongly pronounced words, 'Yes, I will.' Accompanied by consciousness of action, though not very strong." (226) "Quite clear 'alertness' at first warning. Consciousness seemed to swell, and I also had images of eye-movements: eyes and consciousness bulging." (229) "A little more 'alertness' and some kind of muscular tension clearly distinct from alertness."

D. 105. "Made choice for other, knowing dimly it was not as bad as *Zul*. There was swing of attention to find it. This seemed to be a double movement: (*a*) seemed an eye-movement from one word to the other; (*b*) I think a consciousness of action; seemed highly accentuated. I think a summation of these." (10) "Felt a little feeling of alertness accompanied by some

[1] See p. 154.

[2] Wheeler, Raymond H., *Experimental Investigation into the Process of Choosing*, University of Oregon Publication, 1920.

[3] The terms commonly used by all subjects in their differentiation are "mental" and "bodily." These express the meaning they wished to convey, but are of course, not psychological. Nevertheless the introspections are quoted as they were given.

sort of physical sensation I can't define. Any noise now gives me this feeling of alertness with its physical accompaniment. A feeling of mental alertness, a *qui vive* to take in is left if we take away the physical[1] sensations which accompany it." (63) "Am convinced there is a large degree of independence between these two states, mental and physiological attention. Am not now affected physically[1] by the warnings, but there is a brightening of mental alertness." (4) "I feel a sinking sensation when I make a direction of attention. It seems a general muscular tightening—chest, arm, finger, etc., with a general feeling of alertness." (5) "Feeling of alertness; noticed also tightening of upper eyelids." (7) "There is an element of coldness in alertness."

C. 102. "Alertness present, feeling of activity seems to grow and then get small again: with this is a feeling I am stretching my eyes."

In the second place we notice that consciousness of action is present and distinguishable when the kinaesthetic phenomena differ from case to case. The kinaesthetic and organic phenomena show a very wide range of variability, scarcely any two introspections being exactly alike; yet in such cases consciousness of action is distinguished in its characteristic form. It cannot therefore depend on any specific sensation complex. If observation be repeated a sufficient number of times, kinaesthetic and organic phenomena can be analysed into simpler sensation elements. Consciousness of action on the other hand, seems to defy further analysis. It is never more than awareness of the Self-acting; we can become aware of the "Self" as it is in the act of judging, choosing, designating an alternative, etc. We can, especially after some practice, report upon its presence or absence, and on the relative strength of the experience, but beyond this we are not able to find other qualities. This characteristic is similar to that noted by Michotte and Prüm. These authors point out that both their subjects and those of Ach, lived through an activity (*vivait, erlebt*) and that they were conscious of action, or intentional direction, appearing under both active and passive forms. The experience can only be expressed by use of the infinitive[2], and there is a striking similarity between the terms and expressions used in each of these researches[3]. Michotte and Prüm conclude that consciousness of action must be regarded as the phenomenal appearance of the "Self"

[1] By this term the subject means respiratory, visceral and circulatory changes he had previously experienced at the warnings.

[2] "Conscience de désigner, de faire, d'agir, de se tourner vers, de dire, de laisser aller... c'est le seul façon dont on puisse décrire ce phénomène"—*Le Choix Volontaire*, p. 194.

[3] "Il est intéressant de noter que les expressions employées par Ach, lorsqu'il cherche à décrire l'activité, sont semblables à celles dont nous nous sommes servis, (emploi de l'infinitif) ainsi: 'Es ist also auseinander zuhalten die intentional Tätigkeit, das was vorgenommen wird, und die Betätigung, das Vornehmen selbst'"—*Ibid.* p. 311.

or Ego in awareness[1]. They point out that when their subjects attempt to describe this phenomenon they are baffled. It is, they state, an ultimate datum of consciousness. It cannot exist by itself in awareness, but appears as a modality of other phenomena; and needs a substrate which it qualifies[2].

In our investigation, the most striking feature in the introspective reports of this process was the fact that three of the subjects (A., B., D.) discriminated a quantitative aspect in their experience of "activity," and accordingly reported consciousness of action strong, distinct, moderate, weak, faint, little, etc. E.g.:

A. 253. "Strongly marked consciousness of action, reacted to *Yuf*."

A. 220. "Accompanied by distinct consciousness of action though not very strong."

B. 17. "I designated *Laip* with strong consciousness of action."

A. 255. "Then with marked consciousness of action, I reacted with pronunciation of words 'I will,' and considerable muscular strain."

A. 286. "The transition from tension and confusion to clear consciousness of action very marked."

B. 78. "There was a distinct feeling of action and movement filling the whole of consciousness."

A. 248. "Moderate consciousness of action and direction to *Cas*."

A. 209. "*Zul* chosen and designated with faint consciousness of direction and action."

D. 41. "Had a consciousness of action again, but not very pronounced."

D. 46. "Very pronounced consciousness of action, seemed to be a mental movement towards *Tauk*."

D. 51. "Strong feeling of motion. Just a consciousness of motion; no object."

D. 50. "Action of tending towards *Klum* a lingering one."

Other subjects on being pressed to make some estimate of the degree of intensity of the experience, found that they were able to do so. An attempt was made to relate this factor in volitional consciousness to changes observable in the objective records, notably the psycho-galvanic records. We have mentioned before that the

[1] "La conscience de l'action doit donc être considérée comme une forme d'intervention —si pas comme la forme d'intervention du moi phénoménal dans la vie psychique"—*Le Choix Volontaire*, p. 194.

[2] "Le moi ressort d'une manière tout à fait spécial dans l'acte de volonté.... Dans les expériences de Ach, comme dans les nôtres, les sujets 'vivaient' une activité.... Ach signale l'impossibilité de décrire d'une manière plus précise, ce que l'on ressent, ou de le définir en termes plus primitifs. C'est une donnée dernière.... On retrouve chez Ach la même conception de l'activité comme étant un facteur qui ne subsiste en lui-même, mais qui se caractérise par ce que nous avons appelé son caractère d'inhérence; il le nomme 'das aktuelle Moment' en signifiant par là "der relativ zu dem Ganzen unselbständige Teil"—*Ibid.* pp. 311–312.

percentage fall in resistance at the choice varied considerably. At an early period in the research it was apparent that choices where the subject reported strong or marked consciousness of action, were accompanied almost invariably by a fall in resistance higher than the average. With a view to investigating this possible correlation between the magnitude of the fall in resistance and the intensity of the experience of conative activity, the average percentage fall in resistance was obtained from the records of choices in which strong consciousness of action was reported. This average was compared with the average percentage fall for all choices. The following results were obtained from one subject (A.) who, from the beginning of the research, characterised his estimate of the amount of consciousness of action in quite unambiguous terms:

	%
(I) Average percentage fall. All choices	2·75
(II) Average percentage fall. "Consciousness of action" choices	3·3
Variation (II) from (I) ...	... +26·6

It is not claimed that the figure 26·6 per cent. gives an exact mathematical measure of the variation between these two types. We merely wish to indicate the direction in which a general tendency appears to be working, and this figure makes it apparent that there is a noticeable increase in the fall in resistance where strong consciousness of action is reported[1]. Choices in which little or no consciousness of action was reported were then classified, these choices often being described by the subjects as "automatic," "habitual," or "easy." It will be seen from the following table that the average percentage fall in resistance in such choices is lower than the average for all choices, and considerably lower than the average for choices where strong consciousness of action was experienced:

	%
(I) Average percentage fall. All choices ...	2·75
(II) Average percentage fall. "Habitual" choices	1·76
Variation (II) from (I) ...	... −35·5

As these results were based upon a large number of observations (312 choices) it was felt that a possible objective control of the estimated intensity of the experience was indicated. Accordingly, data provided by other subjects were examined for evidence in corroboration of this point. It must be remembered that only three of our subjects reported consciousness of action in unambiguous terms from the commencement of the experiments. In the case of the other

[1] In any case we feel that no particular value would attach to exact mathematical expression of data of this nature, or, at any rate, of the data in its present form.

subjects examined (three) it has been somewhat difficult to classify choices on the same basis owing to their inability to isolate consciousness of action early in the research and to find terms in which to characterise it.

In order to classify choices corresponding to "Consciousness of action" choices it has often been necessary to infer the presence of the phenomenon from expressions used by the subjects. On talking over the introspective reports with these subjects, it will be remembered that two of them selected the suggested term, consciousness of action, as the one best describing the experience they had been trying to express. We therefore feel confident in including their results in the following table. They are marked with an asterisk, and it will be seen that they agree in every respect with the general tendency indicated by the other subjects.

Table XVII. Concomitant variations in intensity of the experience consciousness of action.

	I.	II.		III.	
Subject	Av. % fall for all choices	Av. % fall "Habitual" choices	Variation of II from I	Av. % fall "Consciousness of Action" choices	Variation III from I
			%		%
A.	2·75	1·76	−35·5	3·3	+26·6
B.	4·03	2·15	−53·0	6·4	+58·0
C.*	6·38	2·48	−61·0	8·85	+37·1
E.*	6·34	3·9	−38·4	8·45	+33·1
D.	1·25	0·24	−80·8	1·8	+44·0

From these results we can draw the conclusion that a quantitative aspect of the experience consciousness of action really exists; that the estimate of this made by the subject is reliable; and that the fall in electrical resistance is proportionately greater in cases where the experience appears in its intensest forms.

Later investigation however revealed the fact that distinction between these two kinds of choice on the criterion of presence or absence of consciousness of action does not provide a sound basis of classification, for we have reasons for believing that consciousness of action is always present in some degree when we are conscious at all. There are indications in the introspections that, even in the most habitual type of choice, a dynamic aspect becomes apparent at the moment of reaction, and that there is a fleeting and fragmentary awareness of changes of a conational character, similar to those

appearing in the highest type of voluntary choice. The following remarks indicate this. E.g.:

A. 168. "The choice was not volitional but automatic, and yet active." (170) "Whole was automatic, though energetic: it was active but not volitional." (173) "*Tauk* was accepted; a sort of intentional direction to it. This was automatic." (182) "*Mep!* Like the crack of a whip, a rebound from it to the other. Certainly a consciousness of direction but the reaction I should characterise as automatic." (175) "Mind bounced like a rubber ball off *Mep*. Purely automatic. Later he remarked, 'I now wish to query the automatic character of the reaction.'" (201) "I am inclined to think that this action factor is present in what I call automatised choices." (197) "I think I am continually having consciousness of action; and that it is only in certain forms of it that it is a real volition."

This view receives some support from the reports of changes observable in consciousness at the signals[1]. We noted, when dealing with this point, that in addition to cognition of the stimulus as such, our subjects found an awareness of changes in their conative state. It will be remembered that the term "alertness" was finally selected as best expressing the experience. In every way this "alertness" and "consciousness of action" seem essentially similar experiences. Both are dynamic subjective states of consciousness accompanying mental direction; both are distinguished clearly from sensations of muscular strain and effort localised in the different bodily organs; to quote the unpsychological terms employed by some of our subjects, they are "absolutely mental not sensorial," "they seem to be mental movements distinct from bodily ones." Again both are followed by characteristic falls in resistance, such falls we have shown being indicative of conative effort. Some of our subjects remarked upon this similarity, e.g. "This consciousness of action seems of the same character or similar to alertness but much more faint." "Alertness" is conative and so is consciousness of action." "Can discriminate the same sort of phenomenon (as alertness) at designation of the alternative."

We believe that the dynamic state involved in all direction of intention *is* the consciousness of action; and we strongly suspect it to be present in every type of choice. On the contrary, Michotte and Prüm state that consciousness of action is absent in automatic choice[2]. This phenomenon, they say, is the essential nucleus of the

[1] See chapter III.

[2] "La conscience de l'action est la caractéristique qui différencie l'action volontaire de toute autre"—*Le Choix Volontaire*, p. 194.

volitional act. Other elements in the total volitional consciousness may disappear or change without altering the volitional character of the act; but if consciousness of action is absent the process is reported by the subject as automatic[1].

As we believe consciousness of action to be always present in experience, we have yet to account for the fact that it is not always reported in the introspections. In the first place we have noted that consciousness of action is a subjective process, very fleeting and difficult to catch, the more vivid cognitional elements tending to impose themselves upon it. This was noted also by Michotte and Prüm. Normally we fail to isolate it as an item of cognised experience. Under experimental conditions our subjects first became aware of it in choices which were impeded or difficult, and where an unusually great conative effort was required to bring about the decision. In such reactions, owing to the intensity of the experience, and the "slowing down" of all the mental processes entering into the act of choosing, consciousness of action became an observable phenomenon. Having once had the experience in an intense form, subjects were able to recognise the process in reactions where it would otherwise have been of too low an intensity to emerge clearly into awareness. E.g.:

D. 79. "Very slight consciousness of action. Would not have caught it had I not had the experience before."

D. 66. "Felt small consciousness of action, rather slow. I don't think I would have noticed it had I not been looking."

In Habitual choices on the other hand, the reaction time and the introspective reports show that the whole reaction is short; that the processes entering into it are condensed; that deliberation is schematic and fragmentary, the subject usually being satisfied with the knowledge that in such a combination of alternatives he usually chooses so and so. Under these conditions it is not difficult to see how a faint and fleeting awareness of slight conative experience might easily be missed.

In the second place, especially with unpractised subjects, early in the course of the experiments consciousness of action is fused with feelings of muscular strain and effort which complicate and even mask it. Thus, although there may be awareness of Self-activity, it does not appear in the introspections, because experience is at first reported globally. It is only later on in the experiments that subjects

[1] "Le seul facteur qui dans ces cas est toujours absent est la conscience de l'action"—*Le Choix Volontaire*, p. 195.

are able to analyse this total experience further. We have shown in the preceding paragraph that all subjects are finally able to isolate the kinaesthetic and organic sensations, and report that they can make a quite clear distinction between sense of effort of this sort and consciousness of action. As the subjects become practised in making introspections they are often able to detect these "maskings." E.g.:

A. 35. "Tension from eyes, neck, forehead, which almost masked the consciousness of action. This consciousness of action seems similar to or identical with the intentional direction just mentioned. That is how I can discriminate it out of the massed sensations of muscular effort."

A. 238. "There was consciousness of action, a reference to self, a massive sense of effort; consciousness of action was faint and masked by effort."

D. 63. "If there was a consciousness of action it was cloaked by a feeling of dissatisfaction with the choice."

A. 194. "Am inclined to think that there was a consciousness of action, though I would not swear. There were eye-movements and confused muscular strain which would tend to mask consciousness of action. Still I think I can detect it."

Thirdly, in all scientific procedure it is recognised that unique difficulties attend the observation of a phenomenon that can never be excluded from the material under examination. If, as we believe to be the case, consciousness of action *is* invariably present in all experiences, we cannot isolate it from any group of phenomena, and therefore the method of agreement and difference cannot be applied to our data. But the method of concomitant variations was designed to meet the requirements of just such a case as this; and the full significance of the results we were able to establish by its use (Table XVII) now becomes apparent. We showed that our subjects unquestionably distinguished all degrees of intensity of consciousness of action; and although we could not test for the presence or absence of this phenomenon under strictly verifiable conditions, we were able to manipulate our material in such a way as to produce quantitative alterations in it with a high degree of certainty. We could present alternatives calculated to cause the appearance of consciousness of action, (1) in its strong and distinct form, and (2) in its weakest form. And as the results in Table XVII show, there is a marked variation in the amount of fall in electrical resistance occurring concomitantly with the quantitative alterations in the experience of action.

CHAPTER VI

THE "SELF" AS PHENOMENON IN VOLITIONAL CONSCIOUSNESS

Since psychology became experimental and scientific, psychologists have, from time to time, shown a good deal of interest in investigations planned to obtain experimental evidence for the widely distributed theoretical belief in a "Self" or subject of experience[1]. It is agreed that scientific psychology can take no account of the "Self" unless its presence be reported in unequivocal terms under the conditions of experimental procedure[2].

We propose, therefore, to examine the evidence for immediate Self-awareness in researches fulfilling these conditions.

Experimental psychologists of the Würzburg and Louvain schools have carried out systematic investigations of volitional processes, and by means of the introspections obtained during the experiments, have been able to analyse volitional consciousness in considerable detail.

Ach[3] investigated the phenomena appearing during the univocal will-act. This will-act, followed upon a given stimulus, and the subject knew in advance the nature of the operation he was to perform. He knew, for example, that he was to be shown one of a pair of learned

[1] We assume that the view that the modes of consciousness and their unity can only be satisfactorily described by reference to the "Self" who owns them, has been the one most widely accepted throughout the history of Analytic Psychology. We recognise, however, that from time to time, attempts have been made to ignore this subject-object relation in experience, notably those of Associationism and Behaviourism.

[2] In this connexion Calkins writes (*American Journal of Psychology*, 1915): "The psychological description of self needs to be clarified, widened and enriched by the efforts of all psychologists working in all branches of the science." In the same article Calkins raises the question, "Is experimental psychology adapted to the discovery of the self?" She points out that by the very nature of the subject-matter, our method in any branch of psychology can only in a modified form be called strictly experimental. Exact repetition of the process under consideration, and variation of the material so as to isolate a phenomenon or group of phenomena can never be insured in the subject-matter of psychology. This is especially the case in adapting scientific matter to the discovery of the self. Its inevitable presence in all experience makes it impossible for us to isolate it from any group of phenomena; therefore we cannot test its presence under strictly verifiable conditions. Nevertheless Calkins concludes that the experimental method of introspection—a method in which systematic introspection of a given mental operation follows upon a pre-arranged stimulus which can be controlled by the experimenter—approaches closely to the ideal of the scientist. If the self exists, it should be revealed in such cases as these.

[3] *Ueber den Willensakt und das Temperament*, Leipsic, 1910, and *Ueber die Willenstätigkeit und das Denken*, Göttingen, 1905.

nonsense syllables, and that he had to make an effort to respond as quickly as possible with a rhyme, etc., instead of with the associated syllable. Thus, the material providing the stimulus could be so manipulated by the experimenter that the reaction times for the resulting will-acts could be recorded, and the changes in consciousness repeatedly observed.

As a result of his investigation, Ach unquestionably finds in willing an activity of the "Self." This awareness of "Self," or as Ach says, of the "I," is moreover not merely inferred to exist, but definitely experienced (*erlebt*), and it is of radically different nature from any other experience[1].

His subjects reported that "Self" was immediately experienced

(1) During the primary will-act in which the subject had an awareness of self-involved-in-the-future-activity[2].

(2) In the knowledge of preparedness, viz. that they were ready to perform the appropriate act when the stimulus appeared.

(3) In the self-activity lived through in the complete and vigorous will-act, at the "actual moment" of the decision. At such moments there is a consciousness of correctness in which the "I" stands out as antecedent, i.e. as having entered into the operation previously. There is, in this, an awareness that the present execution corresponds to an earlier anticipated act[3].

Michotte and Prüm[4] carried out a research on somewhat similar lines, but observed a will-act of a different nature. The material and the technical procedure were planned so that records of *choices* might be obtained under experimental conditions. It will be remembered that their subjects were shown two numbers, and that they had to choose between two possible mathematical operations. In some experiments choice had to be made between "multiply" and "divide" and in others between "add" and "subtract." Thus the will-act in the choice had to occur *after* the exhibition of the stimulus numbers,

[1] *Ueber den Willensakt und das Temperament*, p. 241: "Consciousness of the 'I' is essentially different from any other experience. Moreover, in the moment of energetic will-act a definite change of attitude of the 'I' is lived."

[2] *Ibid.* p. 244: "The 'I' foresees the starting-point of relation to the objective moment, i.e. the intended goal. The individual is clearly conscious of these mutual relations of dependence, e.g. 'I will *rhyme*.' Other possibilities may enter, but I will do *only* a definite task: to do so I take care to resolve to do this and only this."

[3] *Ibid.* p. 242: "This knowledge contains, as an essentially constitutive part, the knowledge that the execution of the intended act is the result of the 'actual moment,' i.e. of the 'I really will.' This is expressed in consciousness as 'This is right,' i.e. the execution corresponds to that 'I' earlier wanted.... The 'I' appears as the cause of the action. As a consequence of the knowledge that 'I am the cause of this result,' there comes besides, a consciousness of ability—'I have done this by my willing. I am able to execute this task.'"

[4] A. Michotte and E. Prüm, *Étude Expérimentale sur le Choix Volontaire*, Louvain, 1910.

during a measurable reaction period. The whole of this reaction period was introspectively observed by the subject; and from the reports dictated, Michotte and Prüm obtained material from which a complete and careful analysis of volitional consciousness could be made. Summaries of the most important factors in this analysis have been given from time to time in our discussion of the phases in the act of choice. The point now under consideration is the extent to which the research revealed the presence of the "Self" as an item of awareness.

Michotte and Prüm quote introspections to show that their subjects had an immediate awareness of the "Self" as designating an alternative. This awareness was reported under the term *Conscience de l'action*, and when this phenomenon appeared the subject considered the choice to be truly voluntary, and attributed it spontaneously to the "Self." The authors, therefore, place consciousness of action as the essential nucleus of the volitional act. They state that other elements in the total volitional consciousness may disappear or change without altering the volitional character of the act; but that if consciousness of action is absent, the process is reported as automatic[1]. They conclude, that consciousness of action must be regarded as the phenomenal appearance of the "ego" in conscious life[2].

They finally point out that this phenomenon is not confined to acts of volition, but is reported in all dynamic states of consciousness; for dynamic states have this in common—introspections of them always lead to report of consciousness of action, and to affirmation that the phenomenon can only be expressed by use of the infinitive. Michotte and Prüm are of the opinion that these facts corroborate the view formulated as a result of analysis of the data in *Le Choix Volontaire*—that the "Self" can only appear in awareness under the form consciousness of action.

Boyd Barrett[3] followed the method of Michotte and Prüm for obtaining records of choices under fixed conditions, but used as alternatives for choice the series of tastes already described in chapter II. We there called attention to the fact that Boyd Barrett confined his attention specially to Motive Force and Motivation;

[1] *Le Choix Volontaire*, p. 195: "Le seul facteur dans ces cas qui est toujours absent est la conscience de l'action. La tension, les sensations musculaires, le passage de l'hésitation à la certitude, et les 'notions' peuvent être présents sans que l'acte soit considéré comme volontaire, ni qu'il soit attribué au 'moi.'"

[2] "La conscience de l'action doit donc être considérée comme une forme (si pas comme *la* forme d'intervention) du 'moi' phénoménal dans la vie psychique"—*Le Choix Volontaire*, p. 195.

[3] E. Boyd Barrett, *Motive Force and Motivation Tracks*, Longmans, Green & Co., 1911.

nevertheless, although he made no explicit reference to immediate "Self-awareness" in the act of choice, the introspections of his subjects certainly provide data which might have been brought forward as evidence towards the solution of this question. For example, in discussing the ways in which strengthening of motives occurs he includes the personal factor, and brings evidence to show that subjective impulse may sometimes be sufficient to reinforce a motive which would ordinarily be too weak to gain acceptance. He writes on p. 86:

> In caprice choices a substance is taken on impulse, or for the whim of the moment. The subject, for instance, decides quite impulsively, that intensity should prevail over quality, and takes a sharp bitter taste in preference to a sweet one. At another time, in a weaker mood, he chooses the sweet, and feels he is following the line of least resistance, or perhaps feels an unaccountable dislike to a certain substance itself, and rejects it with a feeling of mockery or a feeling of contempt.

A little further on in the same chapter Boyd Barrett points out that a motive may be strengthened by "reference to a principle," or ideal of conduct. When a subject is confronted by equivalent motives, he may appeal to one of his life-principles; and this is brought to bear upon motivation in such a way that the motive for one of the alternatives is strengthened, and choice is effected. E.g.:

> "I'd better be consistent." "Better take the more familiar." "B. is more definite. I like what is definite."

The wording of these reports seems to imply an immediate consciousness of "Self," and we feel there is little doubt that the experience giving rise to these reports was similar to the "consciousness of act," and the "consciousness of action" reported by the subjects of Ach, and Michotte and Prüm.

Wheeler, who criticises the methods and conclusions of, among others, the writers we have cited, adopted the same method but modified the material[1]. Two pictures or the titles of two Victrola selections were proposed as alternatives for choice. Wheeler maintains that his subjects were all highly trained introspectionists, and that their reports were detailed and carefully given.

As a result of his analysis he concludes: "In volitional consciousness there is no consciousness of activity as such, no awareness of an immediate unanalysable self." "We need no unique element in consciousness in order to become aware of feelings of activity, of willing

[1] R. H. Wheeler, *An Experimental Investigation of the Process of Choosing*, University of Oregon Publication, 1920.

and of the self."[1] Immediate consciousness of willing can be analysed by trained subjects into kinaesthetic and organic sensations only, such subjects failing to report any consciousness of "Self" or "Self-activity." He concludes therefore that volition cannot rightly be called "Self-activity." This result is quite opposed to those previously given. The former investigators agree with Wheeler in finding kinaesthetic and organic sensations in the volitional processes, but in addition, they find that a consciousness of "Self-activity" is also reported. This content of consciousness involves awareness of the "Self" which is active, and it is absolutely different from the feeling of muscular activity. Wheeler criticises these observations, and urges: (1) That Ach's and Michotte's observers report unanalysed experience, while the data of his own investigation was experience analysed into its basal contents—sensory and imaginal processes. (2) Their introspections were faulty because they consisted in interpretations and secondary elaborations from these unrecognised basal processes. (3) When volitional experience is unanalysed it appears as "meaning," "I will," "feeling of activity," "consciousness of self." When a subject assumes a sufficiently analytic attitude, experience does not necessarily mature into meaning, but remains in the form of basal contents. For example, consciousness of "Self" is a complex meaning, varying in content, but quite analysable into sensory and imaginal processes. It is an act of interpretation, and can be shown[2] to pass through four stages of development:

(1) Tactual and kinaesthetic sensations from throat, face, scalp, back of neck, shoulders, and trunk enter awareness.

(2) A behaviour of attention occurs in which these experiences are cognised as total experience. This does not introduce non-sensory elements, but is merely a redistribution of the first elements together with the appearance and functioning of visual and vocal-motor-auditory imagery.

(3) A second distribution of the elements occurs in which the visual-motor-auditory imagery plays a more dominant rôle. This period constitutes the feeling of familiarity, and the recognition of the experience as "consciousness of self."

(4) The process of interpretation which began at stage (2) reached its final stage in a recognition of the fact that "consciousness of self" has developed.

Wheeler is of opinion that untrained subjects cannot distinguish these stages, and therefore they mistake interpretation for basal experience and accept meanings for mental elements.

Calkins has gone carefully into this controversy, and concludes

[1] "Theories of the Will and Kinaesthetic Sensation," *Psychological Review*, 1920, p. 351.
[2] See *Psychological Review*, 1922.

after an examination of the records of both sides, that Wheeler and his subjects have been biased by a sensationalistic theory, and have attended exclusively to the sensational filling of their experience, ignoring their constant but unnoticed awareness of the "Self," which has these kinaesthetic sensations[1]. Calkins calls attention to the fact that the introspections of Wheeler's subjects teem with expressions implying reference to the "I" who is aware of the sensations. Some expressions seem to suggest a feeling of activity distinct from kinaesthetic consciousness, and imply that the subjects *do* find a self-aspect in the volitional situation. She also points out a flaw in Wheeler's evidence. He distinguished two kinds of instruction: (1) imposed from without by the experimenter; (2) self-imposed instruction; but fails to distinguish specific sensation complexes in the two types. In the absence of such differentiation in the kinaesthetic and organic phenomena it is difficult, in her opinion, to see how the subjects arrive at a knowledge enabling them to make the distinction between types of instruction.

Our Own Evidence.

Our own contribution of evidence to this controversy is entirely in support of the view that the "Self" is an immediate datum of awareness. We can bring evidence to show that in the act of voluntary choice our subjects had an intuition of the "Self."

While we are entirely in agreement with Wheeler and others who hold that kinaesthetic and organic sensations are always to be found in volitional consciousness, we can also show that our subjects clearly distinguished a phase in consciousness when "Self-in-action" became momentarily focal. Though this immediate awareness of "Self" was very fleeting and readily displaced again by the sensory processes, our subjects were quite clear and insistent in emphasising the radically different nature of awareness of kinaesthetic and organic sensations on the one hand, and the consciousness of "Self-activity" on the other. Their reports show that they find it possible to separate the two when

(1) consciousness of "Self-activity" and kinaesthetic and organic phenomena are present together in consciousness,

(2) "self-activity" occupies the focus to the relative exclusion of everything else[2].

[1] *Psychological Review*, 1921, p. 356; or *Ibid.* 1922, p. 425; *American Journal of Psychology*, 1915, p. 495.

[2] See introspections quoted in chapter v, p. 122.

Classification of Data.

In the evidence we are about to put forward the actual words of the report are quoted as they stand, together with the number giving reference to the place of the experiment in the series. The protocols have been carefully examined, and allowing for differences in phraseology, all our subjects have been found to have had the experience of "Self-activity" in some form or other. It is convenient for the purpose of illustration roughly to separate reports in so far as they give evidence of "Self-awareness" into four groups. It should be noted, however, that the classification adopted is largely artificial and that the reports shade imperceptibly one into the other in such a way that the same case might legitimately have been included in more than one group. Bearing this in mind, we present the following as types under which our data might be classified.

I. *An immediate awareness of the "Self."* This is often reported in terms which admit of no other interpretation that the subject was clearly aware of the Self-in-the-act-of-choosing. In addition to the quotations given in Chapter V, the following reports corroborate this:

A. 213. "There were eye-movements, and fairly complete verbal imagery, 'Yes, I will.' Consciousness of action and self in the background with reference to *Cas*; a knowledge that this was the sort of choice which was motivated because I wanted to know." (298) "Auditorily and kinaesthetically 'I don't know *Nep*'; repeated several times with great emphasis. A clear reference to self-not-knowing *Nep*. Very considerable muscular tension, and a consciousness of intentional direction towards *Nep*. Relaxation again came suddenly, physiological as well as mental." (302) "Thoughts of nastiness of both, and difficulty of making a choice. Ultimately, kinaesthetically, 'Yes,' as if accompanied by inverted commas, with a consciousness of adhering to or accepting *Zul*, and a knowledge that this was the choice. An awareness of 'Self,' and throughout a good deal of muscular effort which on the inner pronunciation 'Yes' became relaxation." (250) "Desire to know meaning of *Ler*, but belief that it was unpleasant. Consciousness centred round these two motives for *Ler*. There were eye-movements. A perfectly colourless process, ultimately terminated by a distinct reference to self with regard to *Jor*, with a consciousness of action."

B. 13. "Swing of attention with a feeling of activity to *Mep*. Then my 'Self' seemed to intervene." (63) "With a reference to 'Self,' and a consciousness of action, *Zap* was designated. A feeling that I did not want to take it was present all the time also. This reference to self seemed to determine the choice."

D. 37. "Instead of making a mental leap to the object there seemed a lingering mental advance to the thing I-was-going-to-take. It loses every distinctive note and characteristic. It is only in consciousness dimly as the

thing I-am-going-to. My mind seems to be focused at the centre of an imaginary field and the object at the edge." (120) "I chose '*Laip*' with a sort of rush. Sudden drop to the different level of consciousness. A feeling of action rather precipitate and rapid. The sense of direction seemed to be definitely left to right towards an indefinite object at the edge" (i.e. from the "Self" as located). (58) "Then I had consciousness again of an indistinct object towards which I-was-tending."

There seems no reason at all to suppose that this belongs, as Wheeler maintained, to an interpretative period in which secondary elaboration takes place as a result of a formal act of reflexion. It will be remembered that Wheeler bases this statement on the assumption that his subjects were so well trained and practised that they were able to separate the basal contents of consciousness from the meanings which immediately arise from them. This being the assumption on which the weight of his opinion rests, we feel that the investigators of Würzburg, Louvain and elsewhere have the right to make the same assumption in respect of the training and practice of their subjects. Certainly we can trust those of our own subjects who are quite capable of giving a careful and impartial analysis of the contents appearing in consciousness during the reaction period.

II. *A feeling of "Self-activity" reported under the term "consciousness of action."* This term was used especially by subjects who were familiar with previous work on volition and simply adopted a terminology already current (subjects A., B. and D.). It will be remembered that "consciousness of action" was regarded by Michotte and Prüm as the phenomenal[1] appearance of the ego in consciousness[2]. Those of our subjects who employed Michotte's term used it to express their immediate awareness of "Self" energising in some one or other particular way. Therefore the first and second type of "Self-awareness" seem identical.

It will only be necessary to cite a few of these reports from the many which are available, as some have already been given in the previous chapter, "Consciousness of Action."

[1] We are in this research only concerned with the empirical point of view. We are searching to discover the extent to which our data yield evidence of immediate self-activity, and by reason of our method we are obliged to attach the same objective value to all the data we may get from the examination of consciousness. To attach the term "phenomenal" to any of these items suggests the assumption that things of which we may become aware must in themselves be other than they are in our knowledge of them. This is an assumption which we feel cannot reasonably be made as a result of a research of this nature.

[2] "La conscience de l'action doit donc être considérée comme une forme (si pas comme *la* forme d'intervention) du 'moi' phénoménal dans la vie psychique"—*Le Choix Volontaire*, p. 195.

A. 299. "A judgment *Wux* nicer than *Tauk*. An inchoate pronunciation of *Wux* with a consciousness of action. All fairly cold from sensational content other than words. A consciousness of being drawn towards *Wux*." (94) "Then, quite suddenly, though I seemed to have the knowledge I could do it I swung round, and with some consciousness of action and intentional direction I chose *Zul*. In the first part of the reaction there was a certain amount of muscular strain, effort and unpleasure. After the swing away from *Vab*, the muscular tension, I think, ceased." (236) "A consciousness of action. As if the mind touched the balance in favour of the alternative. Absolutely mental not sensorial."

B. 78. "At the moment of decision there seemed to come a 'blank.' There was a distinct feeling of action and movement filling the whole of consciousness." (10) "I could distinguish a sort of mental movement towards *Tauk*." (17) "Still more hesitation, a distinct reference to 'self.' I designated *Laip* with strong consciousness of action."

D. 113. "Felt I should not take it (*Klum*) if not forced, but I *chose* it, and was conscious of a lagging sort of motion towards something indefinite off to the right of the field." (As if to put off taking it as long as possible.) (41) "Felt a consciousness of action again. I seemed to traverse the conscious field." (47) "Consciousness of action; very fast; I seemed to clutch for the desirable object."

III. *An awareness of the "Self" as the subject of states*, such as resolve, doubt, certainty, belief, desire, etc. In these cases the language of the reports implies that the subject was aware of "Self" as the subject of the state, and that it momentarily enveloped the whole consciousness at the expense of the usually more vivid cognitive contents. Resolve, doubt, desire, etc., are states referring to a future in which the "Self" is involved, and they have no meaning unless they are so regarded. Resolve, for example, loses its significance if we deny that, in the experience, we are, in some way, aware of the "Self-in-action." The explanations of Associationist Psychology are inadequate to explain this experience; for it seems impossible to conceive of resolve as a function, except as it is a function of an entity energising in a particular direction. The following quotations from our protocols provide support in corroboration of this latter view which has been very widely current among theoretical writers:

A. 58. "Helplessness; negative motivation; a resolve to wait until there was some definite reason. This was a volitional act, and quite strongly present as a consciousness of action. Dim recollection of previous reaction in which *Mep* had been chosen. Until this resolve to let things go there was a state of formidable tension; immediately after the resolve consciousness became quite colourless." (244) "'*Yuf*' pronounced again. An imageless sort of question, 'I wonder if it's nice?'" (250) "*Ler, Jor*, at least three times. Baffled. Wondered why I did not remember it. A desire to know the meaning of *Ler*, but a belief it was unpleasant." (271) "*Zul* rather faint; then these words in consciousness, 'Yes, I shall,' meaning I shall

choose *Nep* to find out what it is." (288) "A 'hold up,' and a belief it would be like the last reaction in which no choice took place. A period of suspense." (94) "Then quite suddenly, though I seemed to have the knowledge I could do it, I swung round...and chose *Zul*." (131) "Both unpleasant. A confused state. *Mep, Zul,* repeated several times. I determined to wait passively until something happened."

B. 12. "A sense of obligation (to take one) seemed present, but I was still hesitating." (26) "Realised, I did not want to take either. Memory that previously in such cases I had made a motive. Determination to do this now. This resolve seemed truly volitional." (47) "A recognition of *Jor* as the one I took in such combinations. A feeling of familiarity." (65) "Strong belief that *Rit* would be nasty. A desire to take *Ziv* 'the sure and fairly nice,' to save giving myself trouble."

D. 45. "I make the choice because I feel it is time to do so. An element of doubt and curiosity still lingering. I am conscious of movement towards the one I am going to take but mind is also occupied with the other." (88) "I took a glance at *Tauk*, knowing I was going to take *Ziv*."

C. 50. "Dwelt on *Tauk*. Recognised its meaning. Swing of attention back to *Wux* which I recognised as a 'new' one. A belief I had seen it once before. I seemed very doubtful about its value. A belief it was unpleasant. A swing back to *Tauk* and I chose it, with the thought, 'I'll not risk it.'"

IV. *A reference to "Self."* This form of self-awareness is sometimes reported in these actual words, sometimes implied by the context of the whole report of volitional consciousness during the given experiment. E.g.:

A. 139. "Then, kinaesthetically *Laip*, without conviction that it was the more pleasant. With a consciousness of action, and reference to my self, 'I'm going to choose it anyway.'" (230) "A tendency to designate *Tauk* as the more pleasant, but with the second pronunciation of '*Wux*,' was a state of mind equal to, 'No, I shall choose *Yuf* because I should like to know what it is like.' Fragmentary imagery, verbal, jumbled and obscure. But this thought was quite clear and distinct. With a consciousness of action I reacted." (248) "With moderate consciousness of action and direction *Cas*, auditorily and kinaesthetically; with a very vague reference that 'I' thought *Cas* pleasant."

B. 24. "With a consciousness of action, I turned my attention to the other. A sort of statement in consciousness (no imagery). 'It will have to be this one.' Recognition that I did not like it: was conscious that by a reference to self and my desire to carry out the task, I could make a motive for it strong enough to determine the reaction."

D. 50. "Said to myself, 'Well, it must be done, but put off taking it as long as possible.' Action of tendency towards *Klum*, a lingering one. Noticed a visceral sensation of coldness accompanying this." (60) "Had to force myself to take *Tauk* to fulfil the experiment. Felt no satisfaction in it, but there was a consciousness of action. It was rather slow. The movement of the key entered into consciousness this time. Ordinarily it does not." (56) "Took *Vab* with the feeling I was doing an unpleasant duty."

C. 12. "I then had the thought, I'll turn my attention to the other one to ascertain its value." (17) "I tried to search for a further motive." (30) "I then had a state of mind equal to 'Well, I must choose one and end this.'"

Conclusions.

Nature of Self. On this evidence we hold that a direct awareness of the "Self" (the logical subject of experience) is to be found among the processes constituting the total volitional consciousness.

Assuming then that the "Self" as such is an immediate datum of awareness, we may ask, "How can it be described and what is its essential nature?" The immediate awareness which we find reported is relatively empty of content, very fleeting, and readily displaced by objective contents. From the protocols it can only be described each time it is experienced as a bare entity acting in some particular way. It is always, no more than, "Self-as-judging," when it judges, "Self-as-willing" when it wills, "Self-as-resolving" when it resolves. It is clear that we cognise the "Self" in only one of its acts at a time. Thus, we never in one flash of insight of the momentarily focal "Self" find it perceiving *and* judging *and* designating, etc. E.g.:

D. 48. "I am just 'going,' 'taking,' that's all. Not going to or taking any definite thing. Just that I was 'going-to-take.'...There seemed a sort of mental reaching out to this, not exactly a striving, but a stretching out for the object...." (62) "Strong sense of being drawn in a direction to an object. A consciousness of being carried. Direction only definite. Nothing in consciousness at the end."

In this awareness, therefore, we have a unique experience in which the "Self" as subject, cognises itself, and itself as acting. Both Michotte and Ach have already called attention to the character of "lived" experience which the consciousness of action presents[1]. In our opinion clear awareness of "Self" can and does arise from this lived experience as a conscious fact *sui generis*, just as does any other objective conscious fact. It is observable on introspection, and is remembered when the report is dictated as are the other conscious facts of the introspection period. There is no hint in this awareness as to what the active entity may be. The awareness which we find is not therefore an intuition of the "pure ego" stripped of all particular forms of behaviour, but an intuition of the "ego" concentrating its conative energy in a given direction.

Before leaving this topic of the nature of the intuited "Self" it is

[1] *Le Choix Volontaire*, p. 311.

of some interest to note the circumstances under which "Self" was first reported in our research. Our subjects first noticed it during introspections on negatively motivated choices. In these choices the nature of alternatives necessitated detailed and vigorous deliberation. Motivation was often quite complete and the reasons for taking or avoiding the respective alternatives clearly cognised, yet the action was prolonged until the subject directed his whole conative energy towards one of the alternatives. This undivided direction of attention seems to constitute the decision, and it may be described as appropriation of a given alternative by the "Self," in a strong act of conation. At the moment when this happens the subject becomes aware that he is designating[1] an alternative. We have already shown that in such cases the cognitional content becomes very narrowed, the only item in clear awareness being intuition of the "Self" acting in a particular way. It is an awareness of the "Self" concentrating all its conative energy on one object. The relative clearness of these two items—awareness of "Self-acting," and the object towards which the activity is directed—is plainly referred to in our introspections. The object is usually very hazy and ill-defined, and may sometimes be indicated merely by an "intentional direction," while the item in the focus of awareness is the "Self-activity." We quoted introspections in support of this fact when analysing the Final State in the process of choosing[2].

Concept of Self. Before the full significance of the evidence we have put forward on this point can be seen, it will be necessary to draw a distinction between two very different forms of knowledge of the "Self," the concept and the intuition. This is a distinction which does not appear to have been clearly in the minds of all the writers on this question, and many controversial points seem to have arisen precisely for this reason. In the group of evidence placed in Type IV, the "Reference to Self," there is no doubt that many expressions are best interpreted as being a reference of the situation to the concept of self which is a very different thing from the immediate awareness. E.g.:

A. 66. "Equal motives. Feeling of strain. Tendency to choose *Vab* as the less unpleasant. Then with consciousness of action, a rejection of *Vab* with a knowledge, 'If I have to choose for a really serious motive I'd

[1] This term was used by Michotte. "Ce qu'il y a de caractéristique dans l'intervention de ce facteur, c'est qu'il porte directement le caractère de l'action, et ne peut s'exprimer que par l'infinitif; c'est la conscience de 'faire,' 'd'agir,' de 'designer,' de 'se tourner vers,' de 'dire,' de 'laisser aller.'" *Le Choix Volontaire*, p. 194.

[2] See chapter IV, p. 117.

better choose *Mep*, it's more unpleasant.' Floating notions of ethical grounds." (77) "Intentional direction of *Jor* with a consciousness of action, and a thought that in previous choices between these two I had generally chosen *Laip*. Choice of *Jor* really seemed due to a heightening of its hedonic value by something given it from myself." (277) "Knowledge things were taking a long time: a state of mind equivalent to 'I must decide this somehow.' Then with the rejection of *Mep* which was auditorily and kinaesthetically present at the time, the words 'Well, I will,' auditorily present. Clear knowledge I was choosing the nastiest: a clear reference to self."

B. 12. "The thought was present in an intentional way, 'This is a case in which the choice will never be made unless I deliberately will to take one of them.' Sense of obligation present; felt as if I was making a motive." (37) "Realised that both were nasty, but that in such reactions I could always terminate the 'hold up' by a reference to my desire to carry out the task."

We need not in this connexion consider the genesis of the concept, for an enumeration of the main differences between the concept and the intuition will make clear the point we here wish to emphasise.

(1) The concept is a construct, a gradually elaborated abstraction containing a number of notions as to how the Self can act since it has so acted. The intuition is neither an abstraction nor an inference but an immediate awareness of a particular acting entity.

(2) The concept is complex, rich in content and relatively stable. The intuition appears quite simple in content and manifests itself as varying from instance to instance.

(3) The concept is viewed in an objective manner. The intuition possesses a warmth and intimacy not present in the concept, but of a peculiarly subjective character[1].

The contributions of several writers on the subject of immediate "Self-awareness" seem to show that the experience they have in mind when searching their protocols for evidence, is clearly the concept of Self rather than the intuition. Calkins, for example, in discussing the attributes of the intuited "Self" discoverable from experimental investigations, states that the "Self" is (*a*) complex and analysable into elements, (*b*) complexly related to its environment[2]. Our evidence goes to show that, far from being analysable into elements, and complexly related to its objects, the immediately intuited "Self" is the "Self" only in one relation at a given time, and it defies further analysis. What Calkins has to say regarding these two attributes of the immediately intuited "Self" is however true of the concept, and

[1] Also it seems impossible to explain the genesis of, or account for the concept of Self, except by postulating immediate awareness of the "Self" in its different modes of activity.

[2] Calkins writes, "A self being conscious is not only analysable into elements but is also a complex of relations to its environment"—*Psychological Review*, 1906, p. 63.

it seems clear that she really had this in mind. If any doubt remains on the question, Calkins makes her position clear by defining "Self." She writes, "By Self as a psychic fact, I mean what the plain man means."[1] And what the plain man means when he speaks of Self is unquestionably the concept of Self—what he conceives himself to be.

On the other hand, Wheeler's emphatic denial of finding any evidence of immediate "Self-awareness" in his introspections seems to arise precisely from the same confusion between the intuition and the concept of Self. Wheeler states[2] that consciousness of Self is a complex meaning; a content analysable into sensory and imaginal processes; the result of interpretation and reflexion. This being the kind of "Self" for which he was looking, it is not surprising that he found no evidence for it.

Why is "Self" not more frequently reported? It may be asked, Why is "Self" not more often reported? Why do we not find immediate awareness of "Self" in all introspections carried out under strictly experimental conditions? We may suggest the following answers.

In the first place, "Self-awareness" accompanies all conscious experience from the beginning, and is therefore commonplace and habitual. Its place in awareness may be compared with that taken by general coenaesthesia. Since the beginning of life we have always experienced sensations from the various organs, from the position of the body, from its general muscular tone and vascular state. We never ordinarily become aware of these sensations, indeed we are normally unable to become aware of them unless some change occurs in their nature or intensity[3]. In the same way, we believe, immediate awareness of "Self" has sunk to a level at which we ordinarily fail to notice it. We may cognise the experience under experimental conditions, when we are keyed up to catch even the most fleeting and evanescent items of awareness, and when we examine, repeatedly and intensively, conscious content during one short period.

Again, we certainly *do* get the "Self" when experimental conditions are so planned as to produce the experience of "Self-activity" in an intense and striking form. In a previous chapter we showed that this occurred when a subject had to force "Self" to take one of two

[1] *Psychological Review*, 1906.
[2] *Ibid.* 1922.
[3] We do not mean by this statement that we exclude the possibility of becoming aware of sensations such as these under specially planned experimental conditions. The results of experiments on "conative control" show that we can become aware of sensations which are ordinarily below the threshold of awareness.

disagreeable alternatives. We pointed out that in these cases "Consciousness of Action," which is another expression for immediate awareness of "Self-in-act," appeared strongly and vividly as a content of consciousness. We showed that by the method of concomitant variations it was possible to establish a relationship between variation in the intensity of the experience of "Self-activity," and variations in the amount of fall in electrical resistance of the body registered on the psycho-galvanic records[1].

A second reason for the comparatively infrequent report of "Self" is implied in the first. It is difficult to "get" immediate awareness unless it is looked for in the introspections, and to "look for" it, it must have been experienced before.

We have already quoted extracts from our protocols[2] to show that our subjects felt this to be the case. Having once caught the experience of Self-activity they were able to identify it in a subsequent though weaker experience, amongst other and more vivid contents of consciousness. And this is in no sense an unscientific method of observing phenomena. In microscopic work, for example, an inexperienced beginner on looking at a section, say, of a root tip observes little more than a collection of cells and their nuclei; while a more experienced observer detects chromosomes, and all the other phenomena peculiar to cells in different stages of division. The one has never "seen" these objects and therefore misses them, although they are plainly there for the other observer who is looking for them. Moreover, it is often necessary, before the beginner can analyse the complex visual impression which the slide presents, for him to receive various suggestions. He is told to direct his attention to a particular portion of the field where the object for which he is looking may be found. If he still fails to find it, it is minutely described to him; he may finally even need the assistance of a drawing before he can see it. When he does perceive the object he expresses surprise that he failed to notice it earlier.

Thirdly, we are liable to miss the "Self" as an item of awareness because it is so unlike our concepts of the Self. We have already indicated some of the differences, and have shown that, whereas the ordinary percept of Self is grouped mainly about sensorial elements, and the concept consists of a variety of abstract notes, the immediate awareness of "Self" is very simple and bare of content. Therefore if the experience of "Self-activity" is cognised at all, it is not

[1] See chapter v, p. 126.
[2] Chapter v, p. 128.

at first reported under the term "Self," which, for the uninitiated subject, stands for the complex and elaborated content expressing his idea of himself and his various modes of activity.

Fourthly, immediate Self-awareness is very frequently masked by other conscious processes occurring at the same time. We have shown that under the influence of practice, these "maskings" are often detected, and the presence of Self-awareness, even in a very weak form, revealed[1].

Our task in this chapter has been mainly to present evidence for immediate awareness of "Self." We consider that the data at our disposal clearly corroborate, and, in a few respects, add further details to the conclusions of other observers who claim to have found the "Self" in direct introspection.

We maintain that immediate awareness of "Self" *is* an item in the total volitional consciousness. We have shown that it appears under the form of intuition of "Self-in-act"; that the degree of Self-activity can be estimated—and that the intensity of the experience is accompanied by specific physiological changes registered on the psycho-galvanic records. We noted that immediate Self-awareness could be distinguished in our reports from the concept and the sensory percept of Self; we certainly agree with Wheeler and the observers of his school in finding kinaesthetic and organic sensations in volitional consciousness, but in addition to, and distinct and different from these, we find immediate Self-awareness as well.

[1] Chapter VI, p. 129.

CHAPTER VII

CONCLUSIONS

(1) Emotional states were scarcely ever reported during the process of motivation and deliberation. This can be accounted for by the fact that emotions develop on a perceptual level. The major part of the deliberation takes place on a conceptual level, and abstract ideas do not seem to act as appropriate stimuli for primary emotions.

(2) The affective states, pleasure and unpleasure, sometimes occur during motivation, but, within the range of these experiments, there is reason to believe that these are tones or modalities of the activity.

(3) We confirm Michotte and Prüm in finding that consciousness of "Self" and "Self-activity" appears in voluntary choice.

(4) We go further in observing this consciousness of "Self" in many other cases. Indeed we would extend it to all since it is often reported in choices which seem not to be truly voluntary. We acknowledge, however, that this experience of "Self-activity" may not always enter the focus of awareness owing to the intrusion of other phenomena. It is sometimes unintrospectible, even in very voluntary choices.

(5) Consciousness of action occurs, as Michotte and Prüm have stated, in both active and passive forms. It takes the form of an awareness of "tending" or of "being drawn" towards an object. According to the introspections it seems in no sense to be affective, but always conative in character.

(6) There is a quite similar phenomenon observable in processes other than those of the choice—notably at the "warning" signals and at the appearance of the stimulus. This came ultimately to be designated as "alertness." In many cases the phenomenon occurs consciously related to the "Self," and is often clearly so reported in the introspections. In other cases this relation may be legitimately inferred from the wording of the protocols. Consciousness of action and alertness, are therefore terms expressing a similar experience—the experience of "Self-activity." This "lived experience" passes into awareness and becomes introspectible, especially if there is any intensification of the conative set, or any change in the specific determination of its direction.

(7) We maintain that this awareness of "Self-activity" is related to the act of voluntary decision which terminates the process of choosing. In cases of "hard" choice where the "Self" has to make a vigorous direction of its available conative energy to force the adoption of an unpleasant alternative we have the experience in its most vivid and striking form. In less difficult decisions the experience of "Self-activity," though not infrequently introspectible is only of weak intensity.

(8) The subjects came to discriminate these variations in the intensity of their experience of "Self-activity," and reported all degrees of consciousness of action and alertness. It was found that concomitant variations occurred in the psycho-galvanic records. Where the subject has the experience in a vivid form we have a correspondingly large deflection on the curve. Where he reports it as being of only weak intensity the amount of deflection is noticeably less.

(9) We find no justification for Wheeler's statement that consciousness of "Self-activity" can be analysed into the basal elements of kinaesthetic and organic sensations and images. We find that consciousness of "Self-activity" is absolutely distinct and different from the kinaesthetic and organic phenomena which may or may not be present together with it. In our opinion, if there is anything "basal" in consciousness, certainly "action" is; and further, it is unanalysable. In maintaining that action states are interpretations of sensations and images, Wheeler is really affirming a "faculty" of interpretation which makes it possible for them to occur.

(10) The order in which the alternatives in the choice present themselves has no ascertainable influence on the ultimate selection; nor does a high degree of consciousness for one of the alternatives necessarily determine its acceptance by the "Self."

(11) The meanings of the alternatives may develop as individuals or as types. We find a tendency to economy in the processes of perception and evaluation. After repetition of the same type of choice, only such characters are explicit as are fundamental for motivation.

(12) We confirm the results of Michotte and Prüm in respect of the reappearance of the instruction in cases of bad adaptation and negative motivation. We find, however, that the instruction does not always reappear, though it does so frequently. In addition we have shown, both by introspective and objective records, that considerable conative energy is involved in the effort to maintain the

original direction of the conative "set"; and that a condition of bad adaptation affects perception and evaluation, and so leads ultimately to "bad" choice.

(13) The original evaluation of the alternatives influences the choice in a marked manner. With comparatively few exceptions, the *a priori* scale of values corresponds with the one which can be constructed from the results of the choices.

(14) We find however that the absolute value of the alternatives, in itself, influences neither the amount of conative effort in the choice nor the duration of the process of choosing.

(15) Relative value is the preponderant factor influencing both the amount of conative effort and the duration of the choice. Where the values stand in a relation of "likeness" there is more conative effort in the choice, and the whole process is of longer duration than when they appear in a relation of "unlikeness."

(16) Specific types of motivation constantly appear with different types of relative value. A relation of "likeness" leads to absence or equivalence of motives, inhibition of the normal trend of conative activity, muscular strain and tension, frequently a reappearance of the instruction, hesitation, and at the moment of decision an immediate awareness of the "Self-in-action."

(17) Some motives are strong enough in their own right to reach that standard of value created by the "Self" in the acceptance of the task. In these cases the determining tendency meets with no check. Other motives have to be strengthened before the "Self" can adopt them.

(18) The development of a habit of always choosing the same alternative can be broken by the introduction of new alternatives and new motives into the deliberation. In our experiments "curiosity" and "belief" supplied motive-forces strong enough to overcome any of the "old" motives.

(19) The so-called Intermediary Period in the Choice is a moment of transition between two phases in conscious experience. One in which consciousness is occupied mainly by objective contents, the other in which changes in the subjective (conative) state enter awareness as an enhanced experience of action.

(20) In the main we corroborate Michotte and Prüm in finding structural differences between Decision and Consent, but we fail to find clear indication of the relation which is said to exist between the Consent type and equivalence of motives during deliberation. In many of such cases we find that the actual fixation bears one of the

chief characters of Decision—the mental direction. We conclude that mental directions appear unquestionably in Decision; that they appear when Consent terminates a difficult deliberation and that they frequently appear in a weak form in ordinary types of Consent.

(21) At the moment of selection consciousness is very empty of content, the only item in awareness being a consciousness of the "Self-acting," and some presentation of the object to which the "Self" is directing its energy. This object is only vaguely represented. It loses all its individual notes and characteristics and becomes "the chosen thing," "the-thing-I-am-going-to-take."

APPENDIX I

A NOTE ON THE PHYSIOLOGICAL CHANGES WHICH OCCUR WHEN "ALERTNESS" IS REPORTED

I AM indebted to Dr Pickering[1] for the observation that there is dilatation in the pupils of a cat when a dog is presented some distance away; but when more accurate focusing on the object arousing the flight impulse becomes essential for the protection of the animal, the sympathetic action producing dilatation is overcome by the action of the parasympathetic fibres of the 3rd nerve which produce constriction of the pupils. These observations explain such phrases as "eyes dilating with terror," etc.

Such dilatations and constrictions would adequately explain certain rather curious phrases employed by our subjects in their introspections. We noted in our analysis that our subjects reported at the "warning" signals, etc., their awareness of a conative state which they found difficult to describe, but for which the term "alertness" was ultimately chosen. It was very common at these moments for certain vaguely localised muscular changes in the region of the eyes to be discriminated. Expressions such as "swelling of the eyes," "stretching and bulging of the eyes," "emanations from the eyes," "inter-ocular pressure," "swelling of the eyebrows," were frequently used to describe an experience which evidently referred to the region of the eyes. At these moments there was an intense direction of the subject's conative energy to the task, and often a feeling of anxiety. Dilatation of the pupil probably occurred at this moment. But the subject had been instructed to focus on the aperture where the stimulus words would appear and in so doing produced constriction of the pupils. It may be taken that the curious sensations of strain and tension referred to above result from the antagonistic action of dilatation which made accurate focusing difficult.

The subject's inability to localise the sensations correctly, and his difficulty in finding terms in which to report his awareness of these experiences, can be accounted for by the fact that, in all probability, this specific condition had come but rarely into his previous experience; and that he only became clearly aware of it when keyed up to make a very careful introspective analysis.

[1] Department of Physiology, King's College. McDowall has more recently described the various stimuli which bring about dilatation of the pupil in a chloralosed animal, and has made it evident that nocive stimuli stimulate the sympathetic and cause dilatation. The dilatation referred to above is no doubt of a similar nature.

APPENDIX II

THE NATURE OF THE PHYSIOLOGICAL CHANGES PRODUCING THE REFLEX

We stated in chapter III that the reflex was constantly preceded by changes in consciousness of a conative character. It is clear that mental processes can only be said to be the remote cause of the reflex through the many and complicated physiological changes which accompany them. The physiological changes *cause* the reflex. For this reason we were satisfied in finding among the mental phenomena, a "regular conscious antecedent" to the appearance of the reflex. We have not been primarily concerned in this research with the nature of the physiological changes which produce the deflections, nor have we discussed the different theories which have been advanced in their regard. Nevertheless, certain interesting facts on this point came to light in the course of our research.

In co-operation with the Physiological Department, a series of experiments was performed with a view to investigating the reflex in cats, anaesthetised by ether and intra-venous injection of chloralose. In one of the experiments the cat was decerebrate, and in the others equivalently decerebrate by having both carotids tied. Thus, conscious phenomena could not accompany the stimuli. We found, however, that nocive stimuli of the kind which would undoubtedly produce a reflex in the conscious subject (flexing paw, squeezing fore-limb, pinching tail, etc.),. caused precisely the same sort of fall in resistance in the anaesthetised and decerebrate animal.

Drugs such as adrenaline, and conditions such as cold, known to produce constriction of the skin blood vessels, produce a fall in resistance of approximately similar magnitude. Conversely, those producing dilatation—acetyl choline, pilocarpine (in the sweating stage), amyl nitrite—give a rise in resistance. There can in the conditions of these experiments be no question of conscious antecedents and concomitants of the physiological changes produced directly by the action of the drug on the blood vessels, or indirectly as a reflex adaptation due to the functioning of a protective mechanism against a nocive stimulus.

What is of particular interest to us is the fact that similar constrictions in skin blood vessels occur in a conscious subject on the perception of any stimulus arousing an intense state of striving towards or away from the perceived object or situation. These changes in the blood vessels, though they may never have their concomitants in awareness, are apparent, for example, in the "pallor of fright."

We suggest that the title "The Skin-constrictor Reflex" is to be preferred to "The Psycho-galvanic Reflex." Psychologists need see no objection to accepting this title, for in the conscious subject, constriction of skin blood vessels would have been preceded by specific changes in consciousness; and it is with these regular conscious antecedents that psychologists are primarily concerned.

APPENDIX III

Table VI. Effect of space order.

Alternatives presented	SUBJECT A		SUBJECT D		SUBJECT F		SUBJECT C		SUBJECT B	
	No. of times presented	Result of choice	No. of times presented	Result of choice	No. of times presented	Result of choice	No. of times presented	Result of choice	No. of times presented	Result of choice
J.V.	5	J. 5	2	J. 2	1	V. 1	1	J. 1	1	V. 1
	4	J. 4	2	J. 2	1	V. 1	1	J. 1	1	J. 1 *
J.M.	6	J. 6	4	J. 4	2	J. 2	2	J. 2	1	J. 1
	3	J. 3	1	J. 1	2	J. 2	5	J. 5	2	J. 1 M. 1*
J.K.	4	K. 4	2	J. 2	2	K. 1 J. 1	2	J. 1 K. 1	1	K. 1
	6	K. 6	2	J. 2	1	K. 1	1	K. 1 *	1	K. 1
J. T.	4	T. 4	2	T. 2	2	T. 2	2	T. 2	2	T. 2
	4	T. 4	2	T. 2	1	T. 1	1	T. 1	–	—
J.Zi.	4	Zi. 3 J. 1	2	Zi. 2	2	Zi. 2	2	Zi. 2	1	Zi. 1
	5	Zi. 5	2	Zi. 2	2	Zi. 2	2	Zi. 2	1	Zi. 1
J.Zu.	4	J. 4	3	J. 3	3	J. 2 Zu. 1	2	J. 2	1	J. 1
	4	J. 4	3	J. 3	1	J. 1	2	J. 2	2	J. 2
J.L.	7	J. 5 L. 2	3	J. 2 L. 1	1	J. 1	2	L. 2	1	J. 1
	4	J. 1 L. 3*	2	L. 2	1	L. 1	1	L. 1	1	J. 1
V.M.	4	V. 1 M. 3	2	M. 2	3	V. 3	2	V. 1 M. 1	–	—
	6	V. 5 M. 1*	2	M. 2	2	V. 2	2	M. 2 *	1	M. 1
V.K.	3	K. 3	1	K. 1	1	V. 1	2	K. 2	1	K. 1
	3	K. 3	1	K. 1	2	V. 1 K. 1*	4	K. 4	1	K. 1
V.T.	4	T. 4	3	T. 3	2	T. 2	2	T. 2	2	V. 1 T. 1
	3	T. 2 V. 1.	2	T. 2	2	T. 2	2	T. 2	1	T. 1
V.Zi.	4	Zi. 4	2	Zi. 2	1	Zi. 1	1	Zi. 1	2	Zi. 2
	5	Zi. 5	3	Zi. 3	1	Zi. 1	1	Zi. 1	1	Zi. 1
V.Zu.	5	V. 1 Zu. 4	2	V. 2	2	V. 2	3	V. 1 Zu. 2	2	V. 2
	3	V. 1 Zu. 2	2	V. 2	2	V. 2	2	V. 1 Zu. 1	3	V. 3

| | | |

APPENDIX IV

STAGES IN THE GRADUAL CHARACTERISATION OF CONSCIOUSNESS OF ACTION IN SUBJECT D

No. 32. "Something in the choice I am missing."

No. 33. "While I was making this determination something was going on in consciousness. I don't know what. I don't think it was cognitive. It is so hazy I can't catch what it is."

No. 34. "There seemed to be a sort of mental reaching out to this, corresponding to the putting out of the hand. I can't formulate it, not exactly a striving, but a stretching out for the object. This stretching seemed to be for the desired object itself; it had lost all its relativity to *Zul*. I don't recognise this feeling clearly enough to put it into words. Have not consciously experienced anything like it before."

No. 35. "Could not find the feeling I have described this time."

No. 36. "A sort of change in consciousness came in there; i.e. when recognition had passed. There seemed a sudden entire change. At this time my mind seemed to cease to operate intellectually. There was a sudden fall away to a different plane of consciousness. I can feel there is a difference between these two states, but I can't tell you what it is. Does not seem to involve any cognitive elements at all. It is not something merely passive and it is not a blank."

No. 37. "Instead of making a mental leap to the object, there seemed a lingering mental advance to the "thing I was going to take." After I make my decision to take one it loses its relative value. It loses also every distinctive note and characteristic. It is only in consciousness dimly as the thing I am going towards. This makes me think that there is no cognition at this stage, at this level of consciousness. My mind seemed to be focused at the centre of an imaginary field, and the object at the edge. If such as *Ziv* I go quickly across the field, like a leap over. If e.g. *Laip* I go with lagging steps."

No. 40. "Did not experience any consciousness of action. Whole consciousness foggy."

No. 41. "Felt consciousness of action again, not very pronounced: I seem to traverse the conscious field."

No. 46. "Very pronounced. Consciousness of action here seemed like a mental movement towards *Tauk*. A mental leap towards the thing on edge of consciousness. Whole operation exceedingly fast. A sort of mental flash."

No. 58. "Then I had consciousness again of an indistinct object towards which I was tending."

No. 61. "Strong feeling of motion to *Ziv* but not as distinct object, just consciousness of motion. No object."

No. 62. "Strong sense of being drawn in a direction to an object. A motion in a certain direction. Consciousness of being carried. Direction only definite. Nothing in consciousness at end."

No. 70. "Felt I was being drawn in a definite direction with speed and sureness."

No. 71. "Had consciousness of action. A pronounced and definite feeling, but motion seemed slow. Nothing present but this consciousness of motion."

No. 76. "After tastes had gone out of field, I seemed to be carried in a certain direction. Noted that change of level I spoke of. The drop from cognitive stage to stage where I experienced feeling of motion."

No. 84. "Both then went out of consciousness. I am just 'going,' 'taking,' that's all. Not going to, or taking any definite thing. There does not seem to be a single cognitive element left."

No. 85. "The feeling of being carried along which I have reported in a metaphor. Consciousness of action expresses it better I think after all."

No. 86. "Made decision very quickly to take *Ziv*. It then quickly faded from the field even as a definite object. Had a feeling only that I was 'going,' 'taking.' Just that I was going 'to take' *Ziv* was not there as an object. Nothing in consciousness but this consciousness of action. Not only that I was 'taking' it, but that I was going 'to take' it."

No. 105. "Seemed to be a double movement.

(1) Eye-movement one word to another.

(2) Highly accentuated consciousness of action.

I think a summation of these. Recognised *Mep* and it went out of consciousness. Whole movement seemed to cease. Barren of cognitive content. I had left *Mep* and had not reached *Zul*."

APPENDIX V

THE NEW ALTERNATIVES

Tastes were selected from the following list for all the subjects:

Wux	5 drops essence of peppermint to 100 c.c. water.
Yuf	1 gm. citric acid to 100 c.c. sugar solution (saturated).
Kib	1 gm. potassium nitrate to 100 c.c. water.
Cas	1 gm. quinine hydrochloride to 100 c.c. water.
Suj	1 gm. sodium sulphate to 100 c.c. water.
Nep	Distilled water.
Tov	5 drops oil of lemon to 100 c.c. water.
Fip	Same as *Nep*.
Nex	Same as *Wux*.
Noj	Same as *Suj*.
Lek	Same as *Yuf*.
Cev	Same as *Kib*.
Rit	Same as *Cas*.
Ler	Same as *Suj*.

APPENDIX VI

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AUTHOR
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